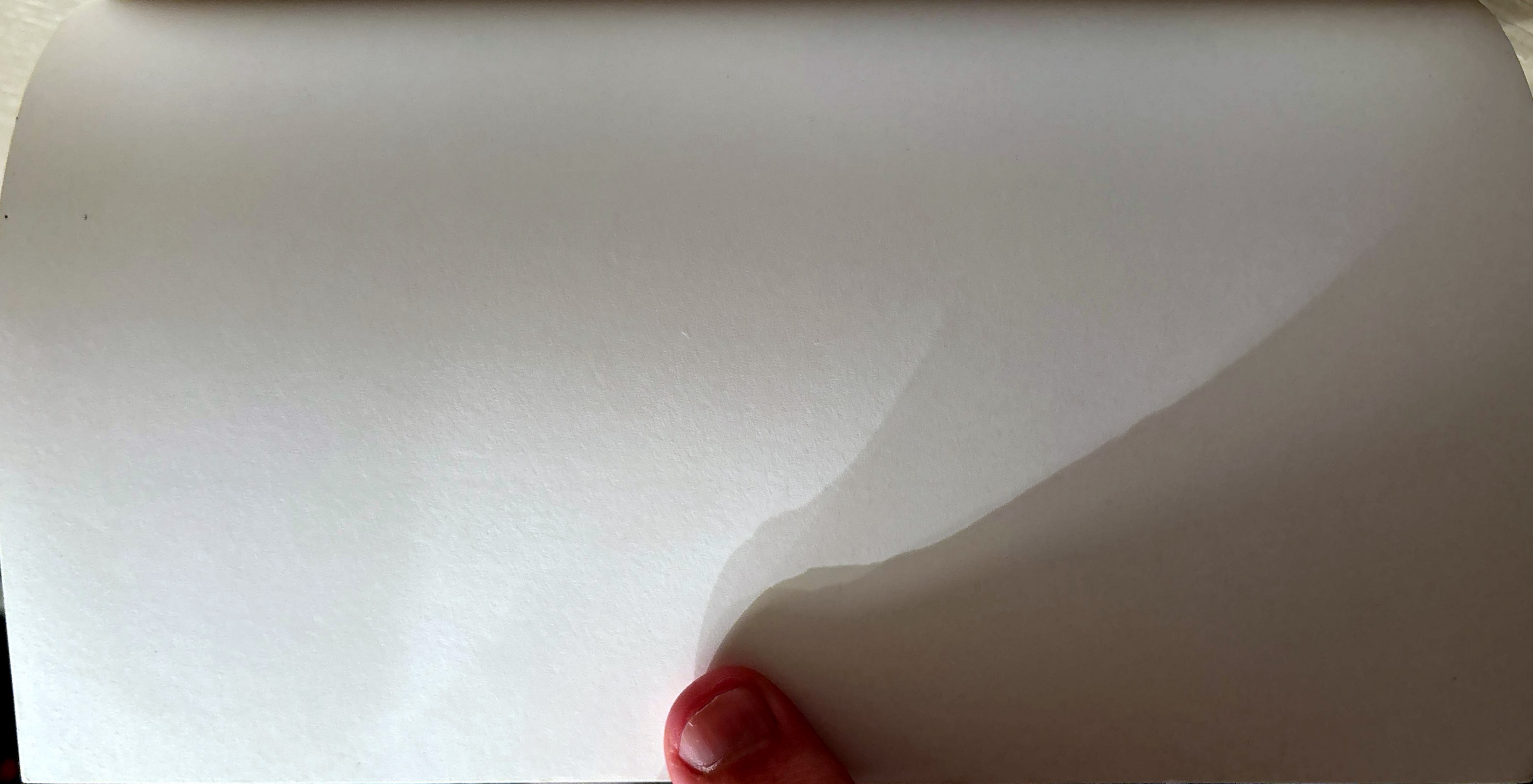
Fowls For Profit - A Practical Treatise on Poultry Farming for Smallholders, Including a selection of the Best Breeds of Fowls for Egg Production and Table Purposes; Their Management, Feeding and Ailments

A.T., Johnson



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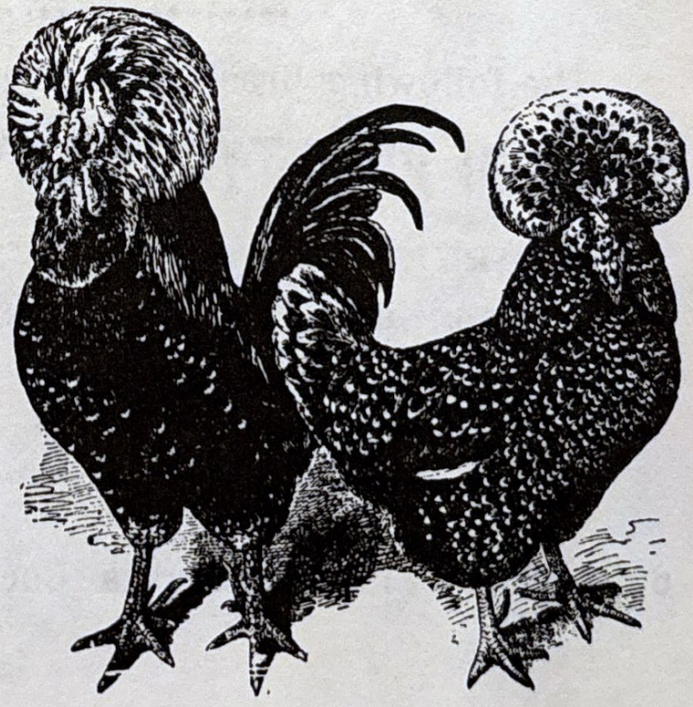

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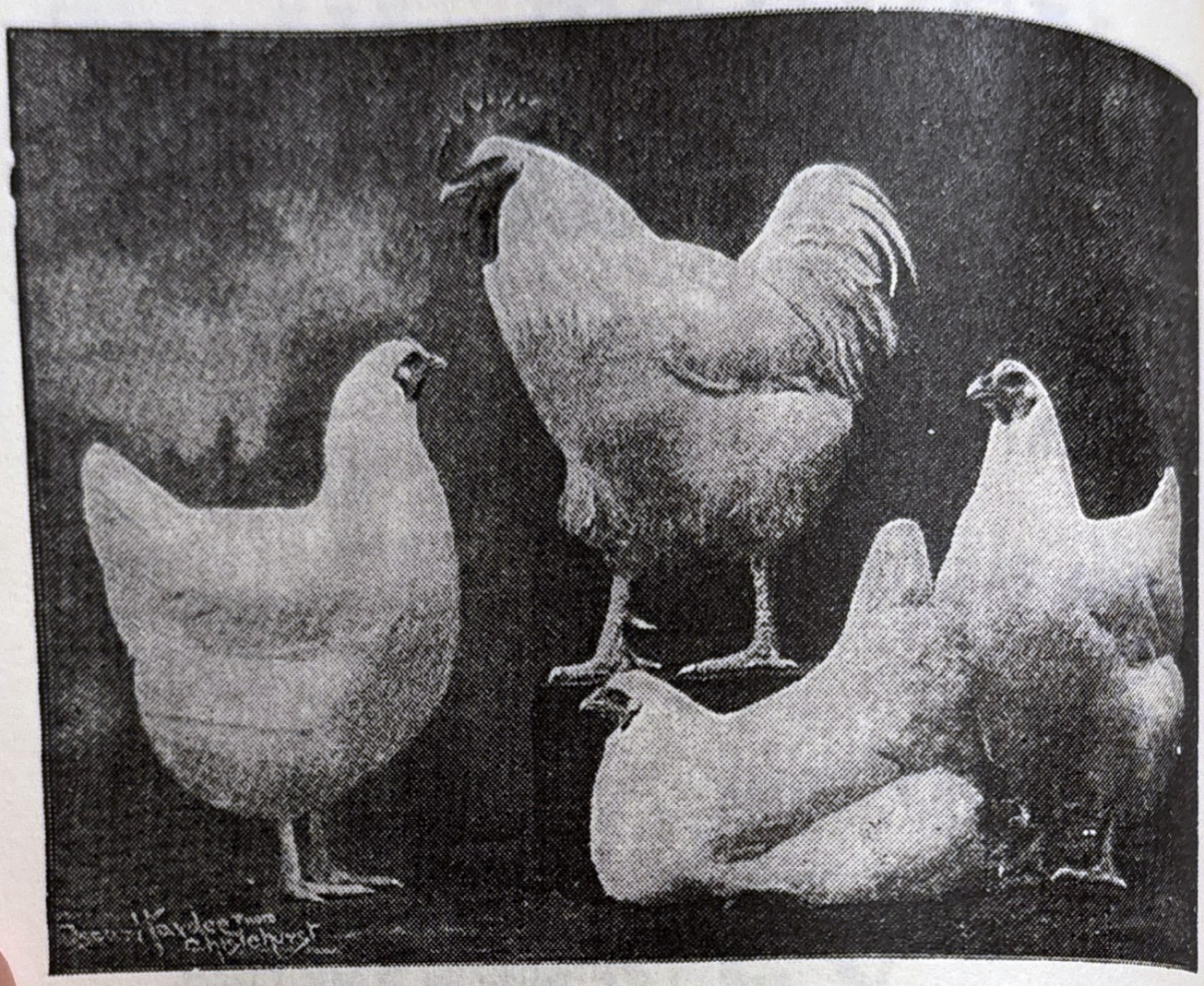

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BY

A. TYSILIO JOHNSON.

Author of "Chicken Rearing and the Management of Incubators," "Ducks, Geese, etc., for Profit."

EDITED BY

T. W. SANDERS, F.L.S., F.R.H.S.

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AN EDITORIAL FOREWORD.

This Handbook, written by a practical Poultry Farmer of many years' experience, has been prepared with the view of supplying Farmers, Cottagers, and Small Holders with sound advice and up-to-date information on the subject of Poultry Keeping for Profit. As the reader will see, after a perusal of its contents, the Handbook advocates Poultry Farming, not as a sole industry, but as one to be carried on in conjunction with other rural industries, as live stock rearing, dairy farming, market gardening, etc. It has been demonstrated by experience that only those who possess a thorough practical knowledge of Poultry Farming, and have had a good business training, can hope to succeed in making the industry a profitable one when carried on wholly by itself. The Farmer, the Cottager, and the Small Holder are the persons who, working on the lines indicated in the following pages, are the most likely to make a substantial addition to their income from following the pursuit of Poultry Farming.

We strongly counsel the reader to read, mark, learn, and thoroughly digest the opening chapter on "Poultry Farming" before embarking in the industry. The advice given therein will show him exactly what the essential conditions are for ensuring success, and then, if he feels

he can fully comply with them, he has only to carefully follow the subsequent advice as to the selection of breed and strain, judicious feeding, proper housing and management of the hens, to obtain a good supply of eggs. Furthermore, he must pay similarly close attention to the all-important questions of grading and packing the latter, to command the proper value for them in the market. He must, moreover, be equally diligent and cautious in the matter of selection of strains for rearing for fattening purposes, pay close attention to the subject of food and its supply, also to the killing, trussing, and marketing of the birds to realize the best prices.

The subject of Incubation is fully dealt with in another Handbook, "Chicken Rearing and the Management of Incubators," by the same author, wherein will be found information on all phases of natural and artificial methods of hatching and rearing, the leading types of incubators and foster-mothers, feeding of chickens, etc. In another Handbook, too—"Ducks, Geese, Turkeys, etc., for Profit"—Mr. Johnson has ably described the rearing, fattening, trussing, and marketing of ducks, geese, turkeys, and guinea-fowl. Thus the three volumes may be said to cover the entire field of Poultry Keeping for Profit.

London, 1909. T. W. S.

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Fowls for Profit.

CHAPTER I.

POULTRY FARMING.

THERE are few industries in this country that have been so thoroughly misunderstood, falsely interpreted and belied, as Poultry Farming. The differences of opinion that exist even to-day among experienced poultry keepers as to what the term "Poultry Farming" really signifies are so varied and antagonistic, that before proceeding I will endeavour to clear the atmosphere and dissipate the mists of prejudice that have always appeared to me to bar the progress of the industry. There are writers who contend that Poultry Farming never has succeeded and never will. These people endeavour to force us to swallow the unreasonable argument that a poultry farm must be a place where eggs and fowls are produced for consumption only, and the moment the poultry keeper happens to sell a bird for stock purposes, or a sitting of eggs, at a little over the market price, he ceases to become a poultry farmer! Was ever a more absurd argument offered to reasoning human beings? Does the dairy farmer cease to exist as such the moment he sells a pure-bred calf for breeding purposes, and

at a price considerably above that which he would have obtained from a butcher? Does the market gardener make his exit if he happens to win a prize at an exhibition, and to sell his bunch of grapes, or whatever it may be, for a price ten times higher that that quoted in the market? To commence hair-splitting over the precise meaning of a general term is an occupation for those who have no other and better employment. Let us make the meaning of the words Poultry Farming as broad and as comprehensive as possible, and, instead of binding a man to follow one narrow course, let us try to point out the surest, most practical, and untrammelled road to success.

As an Auxiliary Industry.—While I am not one of those who denounce the hiring of land for the express purpose of running poultry and nothing else upon it, it must be admitted that the feathered stock will pay better if kept in conjunction with something else. It may be the main object—the chief source of income—and the other branches of occupation may be small in comparison. A certain amount of gardening fits in with poultry keeping, not only from the fact that the manure is so valuable a fertiliser, but green stuff and other vegetables are under most circumstances necessities to the healthful condition of the stock. On quite small poultry farms, other live stock, such as a few sheep, may be profitably kept, and will prove to be extremely useful in keeping the grass short. Fruit may be grown in the runs, and while the fowls fertilise the ground and pick up a great number of injurious larvæ and insects to the benefit of the crop, the foliage provides a shade from the sun or wind.

Practical Experience Essential.—Whatever the plan of operations may be, it must never be forgotten by any beginner that he is entering into a serious business; that he must cast aside all roving fancies such as those which are uppermost in the mind of the boy just let loose from school, and he must prepare himself for a life of honest hard work. It may seem to the reader that it is superfluous to add these

words of warning to would-be poultry farmers, but it is not so. The number of totally incapable persons who have tried the business and failed during the past dozen years is appalling, and one wonders why an occupation so full of risks, so imperfectly understood, and demanding a thorough practical knowledge, should have such a magnetic influence over the youth of the present generation. They appear to think that poultry farming is an industry requiring little or no practical experience, that it is an easy and comfortable open-air life; they have heard the call, "Back to the land," and they read newspaper articles about keeping British gold in British pockets, ousting the foreigner from our shores, and a lot more clap-trap of a like kind, with what result? They sink their capital—perhaps the savings of many years—into the concern, and work with all their might. But work wrongly directed is so much wasted energy. The practical knowledge of the management of the stock is entirely wanting, and the quagmire of difficulties is encroaching upon every side. Profits, if, indeed, there ever were any, begin to fall off, and by the end of about two years, or sooner, the poultry enthusiast is forced to retreat to the doleful tune of the auctioneer's hammer.

Business Capabilities and Work.—The history of the growth of the poultry industry during the past few years is rich in the records of failures and, although it is pleasant to note a rapid change for the better in the class of workers now going into the business, there are many yet to whom a word of advice may mean a salvation. I do not want to discourage poultry farming; on the contrary, it has always been my endeavour to foster the industry, and give it all the encouragement it deserves. There are few occupations that will pay so well in proportion to the outlay as this one, but it must, like every other business, be in the hands of those who know what they are about. It would be the merest folly to embark and sink capital in any undertaking unless we were backed by sufficient practical knowledge to push it to a successful issue. Poultry farming, too, requires, if anything,

far more experience and ability than any other rural industry. Fowls are small beings, yet each one is an individual subject to as many, if not more, diseases as attack larger animals. The epidemics that frequently devastate poultry yards are peculiarly deadly, and, on account of the number of individuals, are most difficult to combat. The profits must be gleaned in numerous small amounts, which demand particular attention as regards book-keeping, and a methodical way of working. Then there is the question of labour, which in a farm of any pretensions, is, perhaps, the most serious item. There is a difficulty in getting the right kind of labour, and the price of it, even if not skilled in the work, is a more formidable item than rent or food. To overcome this, the poultry keeper will have to possess a power of organisation of no mean order. Everything must be done methodically, yet not exactly automatically. An intelligent eye must be kept wide open for any dodge that will help to minimise labour. Even on the best organised establishments the hours are long and fully occupied. Sixteen hours a day during summer is the usual lot that falls to the poultry keeper, and the work during that time is of such a tedious character, owing to the monotonous sameness of "the daily round, the common task," that the faint-hearted, and holiday-making fraternity need not attempt it. There is not much doubt but that the huge poultry plants of America, with which we have nothing to compare, owe their very existence to the facts that they are built and arranged so that the greatest number of birds can be attended to in the shortest possible time, by the least number of men, and that the "cuteness" and briskness of the American is peculiarly adapted to the work. The British poultry keeper must have more of this energy, enterprise, and pluck before he can rival Brother Jonathan in utility poultry keeping.

A Word about Tuition.—How is one who is desirous of making poultry farming his life's work to become proficient? He must serve his apprenticeship as he would if he were entering any other trade or profession. The choice of a farm whereon he may go as pupil will depend upon his

inclinations; *i.e.*, whether he prefers to go in for breeding pure-bred stock, egg production, table poultry, or fattening, or two or more of these combined. The establishment should be one of repute and long-standing, and the pupil, although he may work, and must work, in fact, if he would learn, will have to pay for his tuition. Two years' pupilage is not a day too long, and if that period could be divided between two different establishments, so much the better. I put two years as the minimum required for a youth of average ability. Some will pick up the work in an astonishingly short time, while others will exceed the above term and yet be quite unfitted to start for themselves. The pupil should train himself to not only do what he is told in a willing manner, and to the very best of his ability, but he must learn to be sharp and active, methodical, and, above all, observant. He must use his eyes so that by practice he may be able to detect a sickly individual in a flock of some hundreds, and, if possible,, to know the fowls individually as an experienced shepherd knows his sheep. After serving his term he would do well to go as poultry man on another farm for six months or a year, so that he may feel what it is like to carry some responsibility on his shoulders.

Capital Required.—Poultry farming is an industry that calls for a large capital, and the beginner who outlays his £100 must not think that he will thenceforth reap £1 per week. It would be impossible here to state definitely the amount of capital that is necessary in starting a poultry farm, because that must depend upon the conditions and circumstances of the case. It is most unwise, however, to outlay the whole of one's available capital, leaving no reserve for emergencies. Even if the amount that is available be small, a part of it must be put on one side as a reserve fund. Further, it would be a reckless policy for a beginner, never having had a place of his own before, to start in anything like a large way. The most successful and permanent establishments are gradually built up on sure foundations, and the young poultry farmer must be content to start small and extend his business as it pays its

way. The progress must be slow. The market has to be worked up by degrees, and the stock bred up to the greatest possible perfection, more particularly as regards laying. To breed a good strain of layers, which is essential to success, is not a matter of a year or two, but of many years.

Who may Succeed.—The great bulk of home-produced eggs and poultry, however, is not, and never will be produced on poultry farms. It is to the cottager and the general farmer, large and small, that we must look for the greater part of our supplies, and the main object of this Handbook is to encourage poultry culture, not only among the comparatively few who give themselves up entirely to that pursuit, but among the vast rural population of the country. I hope to endeavour to show how, by better management, the poultry may be made one of the most profitable branches of the farm; how the cottager may make an addition to his income, which will be a comfort to himself and his family; how, in short, the much-neglected fowls, with proper housing, feeding, and breeding, may be made the means of keeping at least a few of our rural community on the land, and of drawing others from our congested towns to take part in the healthful industries of the open country.

CHAPTER II.

THE EGG TRADE.

The most striking fact that we have to consider in connection with the trade now carried on in eggs, is the tremendous foreign importation. I do not intend to go into the statistics of the subject, which mean but little to most of us, but it will be sufficient to state that the value of the annual import of foreign eggs now amounts to considerably more than six million pounds. Notwithstanding that fact, and that we are producing at home very many more eggs than we ever did before, the price and demand have been well maintained, and tend to increase rather than diminish. Eggs becoming more of a national food, the population of the country growing enormously, and the annual influx of townspeople to seaside and country resorts, all tend to affect the egg trade for the better. A few years ago there was no such thing as a "market" for English "new-laids" in London, but now there is, and the prices realised are very satisfactory, particularly in winter. In the face of the ever-increasing importation of eggs from Russia, France, Germany, Belgium, Denmark, and Ireland, there never was a better market than the present one for our own productions. All the evidence goes to prove that the foreigner does not clash with our home trade to any noticeable extent, and if those who write articles to daily papers on this subject, to be read by those who are as much in the darkness as to the true facts of the case as the writers themselves, if they, the writers, would consider the English poultry keeper selling eggs at 5s. or 6s. per 120, and hoping to make a living out of it, after the manner of a Russian peasant, I think the emptiness of their well-intentioned arguments would be revealed to them. We must look at this subject in a much

broader light. Is it not a good thing for us as a community, while our own egg market is practically unaffected, that we can import millions upon millions of cheap eggs for manufacturing purposes? Imagine what an enormous number of cheap eggs are used every year in our photographic establishments, by calico printers, bookbinders, leather finishers, kid-makers, and others. We have not any idea, as outsiders, to what a number of uses this cheap, imported albumen is put. Would it not be a bad day, then, for England if our shores were closed against the importation of foreign eggs? Even supposing the production of eggs in this country to increase enormously, I doubt very much if we could then supply our own needs.

The Foreign Egg Bogey.—On the whole we may take it that, from our egg-producer's point of view, the foreigner need not be the "lion in the path" as he is so often depicted. The foreign egg is one thing and the genuine English "new-laid" another. I would not say that the former never indirectly affects our own market, because it in some cases undoubtedly does. For instance, there is a flourishing trade done in many parts of the country by unscrupulous dealers who buy cases of foreign and Irish eggs (which they mix with our own, or not) and retail them as "English new-laids." Yet, even this is not the fault of the foreign egg, but the blame should rest on the shoulders of the miserable cheat who, while he is tightening the noose around his own neck, is very effectually spoiling our home market, and helping to brand the country egg with a name it does not deserve.

Why Foreign Eggs are Preferred.—It may be said that the market salesmen prefers the foreign article to our own, and so he does. Why? Because our own supplies are so irregular, unreliable, and badly marketed, that they cannot compare with the best eggs from abroad. The dealer has long ago found out that he can lay his hand on just as many eggs as he requires at a day's notice from the Continent whether it be at Christmas time or in June. He can order a

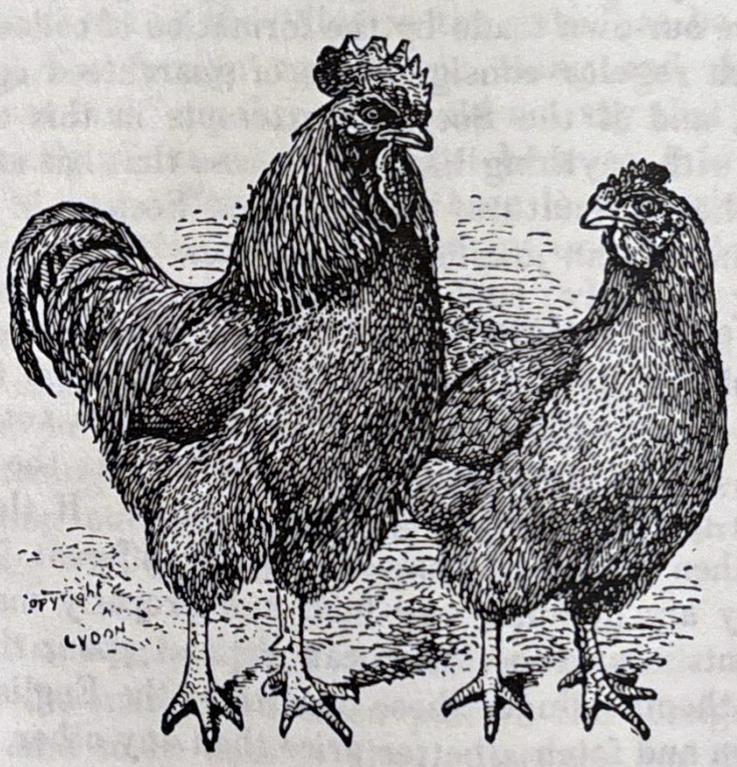
certain quality or grade and be sure of getting it. The eggs are well packed, sorted, clean, crated in given quantities, and of better quality as to freshness than a country lot sent up from one of our own counties. The latter are too often badly packed, unsorted, stale, and the consignments irregular. The market is overflowing with supplies in summer, while in winter they are practically reduced to nil. What then is the wholesaler to do if he cannot get regular supplies of reliable eggs in this country? He goes abroad for them, and will continue to do so until our producers can guarantee regular quantities, of reliable quality, properly marketed. The foreigner simply supplies the market with what we have failed to do. Before we can hope to gain the confidence of the market, we must not only improve our methods of breeding and general management of the stock, but our whole system of marketing will have to be reorganised. Attempts are being made, mainly by the National Poultry Organisation Society, to improve our own trade by the formation of collecting depots from which regular consignments of guaranteed eggs may be marketed, and if the Society's attempts in this country are rewarded with anything like the success that has attended the work of the Agricultural Organisation Society in Ireland, it will have more than justified its existence.

Advice to British Egg Producers.—In summing up this subject, it may be repeated that, although the foreign egg holds the market, as it were, yet it does not adversely affect the sale of our own supplies so long as the latter are reliable in quality and regular in quantity. If they are indifferent then they will compete with indifferent foreigners; but if they are genuine new laid, and properly marketed in consignments that the dealer can depend upon, the market is open to them. Under those conditions the English egg can hold its own and fetch a better price than any other, and there never was a better demand than there is at present. The outlook is distinctly encouraging, and the producers, one and all, should do everything in their power, by straightforward, honest dealing and improved management, towards keeping the industry as far as possible in their own hands.

CHAPTER III.

BREEDING FOR LAYING.

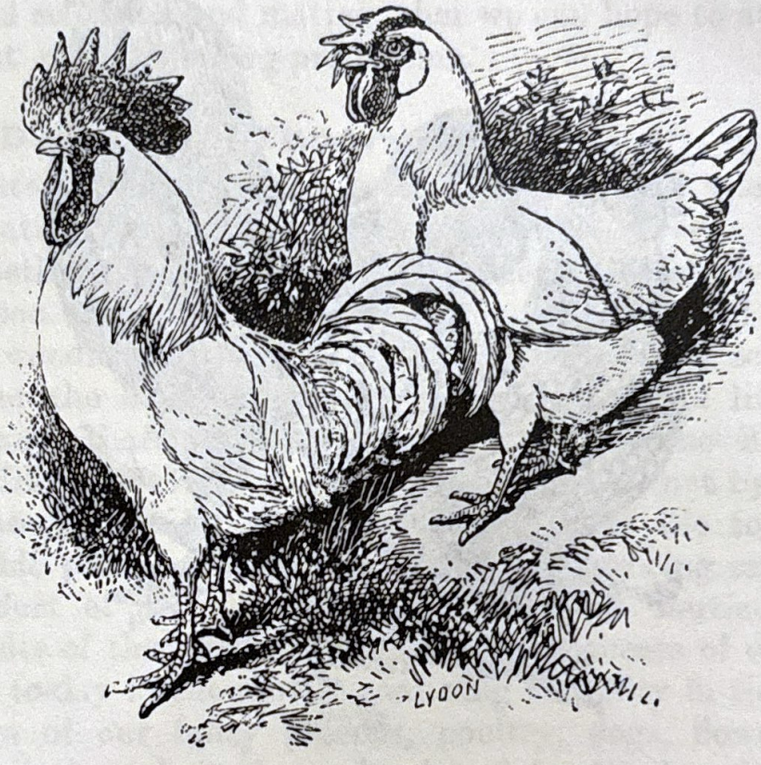
THERE are certain conditions that are essential to success in poultry farming for egg production, and the most important of these is the breeding and maintaining a stock of hens that are prolific layers. We must not be biased by colour of plumage or breed, but make prolificacy the main object. It is natural that a beginner should ask when he is about to start



BUFF ORPINGTON COCK AND HEN.

poultry keeping the question, "What is the best breed?" or, "What breeds are the best as layers?" While admitting that there is a vast difference in the laying qualities of some of

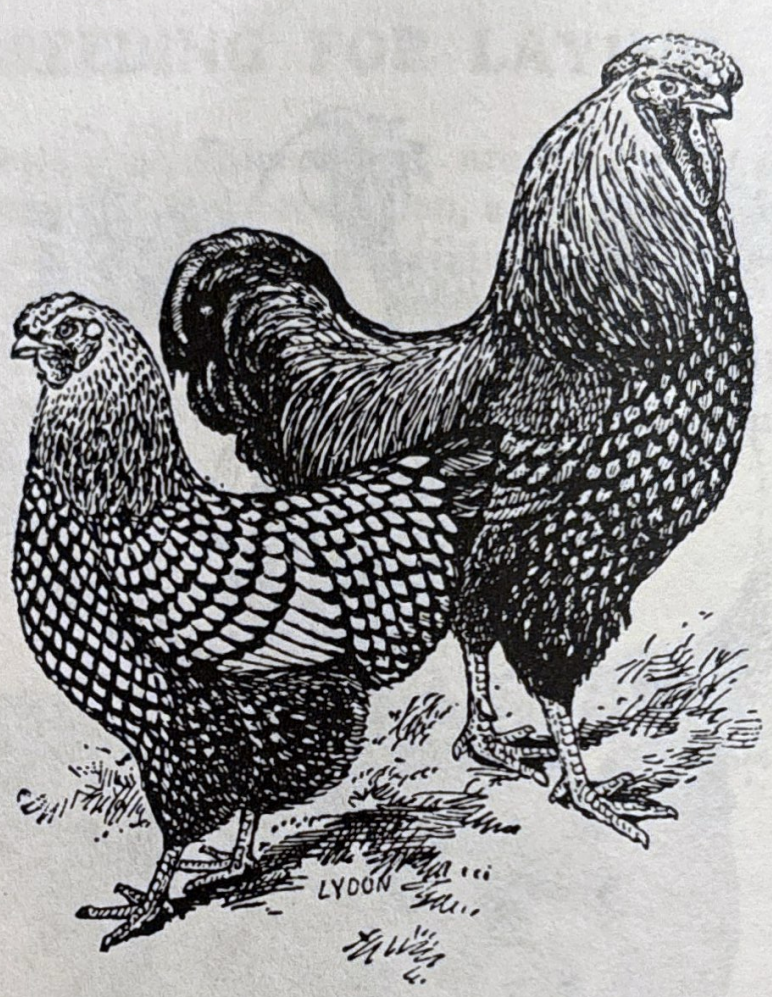
our various breeds yet many of them, such as the Mediterraneans, might well be catalogued together as being somewhere about equal. Of these the Leghorn may be taken as a type of the whole class that includes Minorcas, Anconas, and Andalusians. These breeds, as a whole, may be considered more prolific, as layers, than the heavier Asiatics, and they are non-sitters, laying white eggs. On the other hand, the off-



White Leghorn Cock and Hen.

shoots of the Asiatics, namely Orpingtons, Wyandottes, and Langshans, layers of tinted or brown eggs, often prove, owing to their greater hardiness, to be better egg-producers during winter than the non-sitters. Then there are the cross-breds, the offspring of a mating between two distinct breeds. The effect of crossing promotes stamina and vigour, and therefore, if proper care be taken in choosing the sexes, the progeny of a cross often make more prolific layers than either of the breeds to which the parents belonged.

Selection of Good Layers.—It will be gathered therefore that there is no breed or cross that can be said to be "best," but, given a flock of hens, it is possible to pick out the "best" individual layer from that flock. The productiveness of the various members differs to an extraordinary extent, and it is that fact that the beginner will have to engraft upon his mind. Each of his hens, in so far as



SILVER LACED WYANDOTTE COCK AND HEN.

she is considered a breeder, must be treated as an individual, with properties differing from the others, not in kind, but in degree. In a flock of hens chosen indiscriminately, there may be individuals that do not lay as many as 40 eggs each in a year—not enough to pay for their keep—and others there may be that will produce 150 to 200 eggs each in the same period. It does not, therefore, require any great effort to understand that, if we breed and hatch pullets from every member of the flock, without selection, we are merely perpetuating the

good along with the bad, and every succeeding year will bring no improvement to the stock as layers. On the other hand, if the best layers are sorted out (and the wastrels disposed of) and mated to a cock whose parents came from prolific stock, there will be a vast improvement in the egg yield of the pullets the first year. Then, if these pullets are again selected for their prolificacy, the poorer layers from among them being discarded, and mated to a cock of the right blood, the progeny of the union will show a still further improvement. It is only by careful selection and mating, that we can hope to attain the very best results in egg-production.

The Darwinian Theory.—The variability of animals and plants, both when in a state of nature and when under domestication is the hub which almost every scientific man, whether zoologist, botanist, gardener, or stock-breeder, works upon. Variation, a struggle for existence, and the consequent weeding out of the unfit, is the universal scheme of nature for the evolution of the endless variety of life, plant and animal, that we see around us. Before the illustrious Charles Darwin revolutionised modern thought, not by inventing a theory, but by reducing the science of life to a comprehensible plan, selection was unconsciously being carried on by breeders of live stock, and thoughtful horticulturists. The results of the labours of these early pioneers of evolution are seen to-day in the almost confusing diversity in the colour and form of our fancy pigeons, poultry, dogs, flowers, and fruit. All these have been developed by the breeder fixing any slight variation the individual possessed, which most nearly approached the ideal in view. Youatt, who is a recog nised authority on agriculture, writes that the principle of selection is "that which enables the agriculturist, not only to modify the character of his flock, but to change it altogether. It is the magician's wand, by means of which he may summon into life whatever form and mould he pleases."

How to Select a Good Laying Strain.—The poultry keeper, if he would succeed, must hold fast to that

magician's wand, and wield it in whatever direction he wishes to work. As an egg-producer he must ever be on the look out for variability in the productiveness of his individual layers, and the principle of selection—the rigorous weeding out of the unfit and the perpetuation of the fit—must be his daily watchword. How is he to go to work? How is he to distinguish the good from the bad? In the first place, he must use his observation. A good layer is bright and active; she is out first in the morning, and out last at night, busily searching the fields for natural food. She will go to roost with a crop full—that is to say, if she is at liberty and has the means of filling it. She is, as a rule, in fine condition, and her feathers are more closely set than the wastrels who huddle about the roosting houses morbid and drowsy. A good layer will be found on the nests in the cold, wet days of November and December, and on such an occasion she may be caught and marked, by a ring on the leg, so that her winter-laying propensities may be perpetuated in the breeding pen.

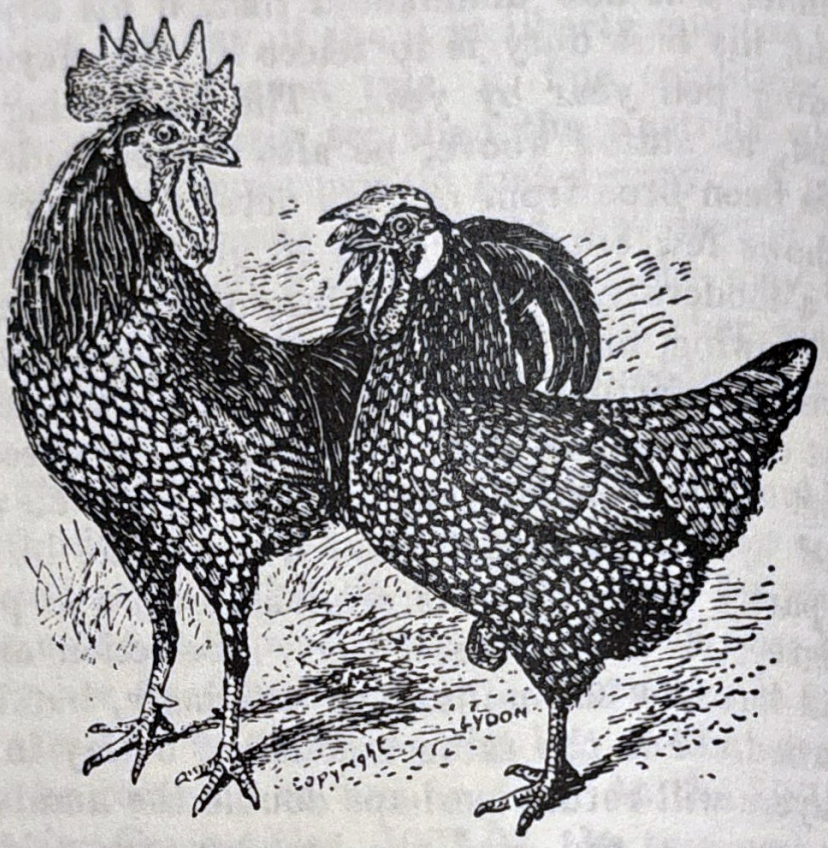
Trap Nests.—With a little additional trouble and expense, both of which are amply repaid, the trap nest may be brought into use. This is a contrivance by which a hen entering a nest has to pass swing doors which close behind her, preventing her from coming out. Every hen is known by a number, attached to a ring on the leg, so that every egg she lays may be recorded to her credit. At the Utility Poultry Clubs' Laying Competition, 1902-03, the trap nest was used to ascertain individual scores, and the results are most striking, and prove the value of the system as a means of getting at the best layers in a way that must convince the most sceptical. For instance, the trap nest showed that while the winning pullet laid 78 eggs in 112 days, *i.e.*, October to January inclusive, a remarkable performance, many of the individuals only laid two or three in the whole period, and some none at all. The certainty and the thoroughness with which the trap nest, properly attended to, will do what is required of it, must place it far ahead of any other means of selection. It requires constant attention in liberating the layers, and the recording

of the eggs on the chart becomes, at times, tedious, but there is no doubt that the finest laying strains in existence to-day—those of America—have, most of them at least, been built up by the infallible trap nest.

Pedigree Breeding for Laying, although quite a new thing in England, has been taken up rapidly during the last few years, and already the effect of the system is making itself evident in the greater productiveness of our poultry. The beginner will now understand that, if his object be egg-production, his first duty is to select his best layers only for the breeding pen year by year. The cock being "half the pen," must, as stated above, be also chosen with care. He must have been bred from parents noted for their prolificacy. A cock shows few outward signs to guide us in our choice, although a moderately large and bright comb, natural vigour and early crowing, may be taken to denote prolificacy. If the cock proves satisfactory, he may be mated the following year to the best of the pullets without any fear of ill effects through in-breeding. After that the utility breeder will do well to get fresh blood by the introduction of a new male bird. If the latter be partly related to his original cock, and possesses a good pedigree, so much the better. Selection and careful mating will have to be maintained untiringly, but it will not be unrewarded. For the same amount of outlay in food, the pedigree layers will return perhaps double the number of eggs that their ancestors did, and the breeder may pride himself in having bred up a strain of layers that in large flocks may average 150 eggs or more, per annum for each hen.

Strain, not Breed, that is Wanted.—It is strain and not breed that tells on an egg farm. There may be any number of strains, or families, of a given breed, all differing in their productiveness. For instance, A breeds Orpingtons for show purposes, and ignores laying qualities; B keeps the same breed but selects for laying only, ignoring the requirements of the show standard. Here we have two strains of one breed differing enormously from one another in their laying

capacities, which shows the fallacy of comparing breed against breed, in a question of laying. It is true, as I have already pointed out, that certain types of fowls are more productive than other types. An average Ancona, for instance, will lay more eggs in twelve months than an average Dorking. The choice of breed, therefore, is a consideration, although strain stands first in importance. Under most circumstances pure breeds will pay better than crosses. They do not cost any



ANDALUSIAN COCK AND HEN.

more to keep than the latter. Sittings of eggs may often be sold from them at very much above the price of table eggs, and the surplus cockerels can usually be sold for stock purposes at prices according to the quality and productiveness of the parents. Among the most popular breeds of the present day which are sitters, laying brown eggs, may be mentioned the Wyandottes (particularly the white variety), Orpingtons, Plymouth Rocks, and Faverolles, and of the non-sitters, the Ancona, Leghorn, Minorca, Andalusian, and Houdan. Provided the

strain is right, anyone of these would be suitable as layers under most circumstances. The non-sitters are the best foragers, and are all hardy, with the exception of some strains of Minorcas, which do better with plenty of shelter in winter.

A Pair of Ancona Fowls—Old Utility Style.

Barndoor Fowls.—The small farmer or cottager who is desirous of improving the laying capacity of his flock of "barn-doors," and who cannot be expected to make a "clean sweep" of his stock and start again, may do much by introduc-

ing a pure-bred cock of a good strain. One of the best breeds for this purpose is the Houdan. The progeny will not only be superior to the old stock as layers, but the introduction of the Houdan blood will improve the table qualities also—and a good all-round fowl will be the result. Even the cottager, however, cannot be excused for neglecting to select his breeders

HARDY FOWLS (BLACK ORPINGTONS).

every year, even if he does it by observation only. If he wants eggs he need not crave for the latest pure breed, which may not lay as many as his own mongrels. By far the greater number of farmers and peasants prefer, for obvious reasons, to keep a generally useful fowl rather than one that is exclusively either a table fowl or a layer, and a Houdan cross seems most nearly to approach perfection as such. Not only may the Houdan cock be turned down with the "barn-doors," but

he may be mated with Orpingtons, Black or Buff, Minorcas, or Leghorns, with excellent results. If a general purpose fowl be required, it would be difficult to use a Houdan in the wrong place. If a pure breed were wanted for all-round purposes, it would be hard to equal the Buff Orpington. It is a good winter layer of brown eggs, hardy, large, and possessing a fine white flesh. The highest degree of perfection in both the qualities, laying and table, cannot, however, be combined in the one fowl.

CHAPTER IV.

MANAGEMENT OF LAYERS.

Best Time to Hatch.—Having selected our breeders, they should be mated up about the end of January, so that chickens of the heavier breeds may be hatched in March, and those of the lighter, more active kinds about the middle of April. A great deal of importance should be attached to the date of hatching. It the pullets come to maturity too early in the year, they will lay a few eggs in the early autumn and then probably go into moult, with the result that there will be no more eggs until Christmas, or after. Supposing them to be hatched at the time stated above, they will come to maturity about the end of October, commence laying, and continue throughout the winter. Then, if the hatching is too late in the spring, the cold weather sets in before the pullets have matured sufficiently to lay, and they will have to be kept throughout the winter—at least until January or February—without making any return. If farmers and cottagers would only look ahead and consider this fact there would not be such a dearth of eggs during the winter. As a rule the chickens

get hatched early enough, but the "higgler" has "his eye on them." They are the first broods of the season, and towards the end of May fetch a good price. The cottager is tempted to part with the lot, including the pullets, on being offered 4s. to 5s. per couple. She wants the money, and if she refuses to sell, the "higgler" is offended and declines to call later on in the year when young stock are plentiful. So the "hen-wife" takes the cash and parts on good terms with her patron, but she has thrown away any possible chance that she may have had of getting winter eggs, and when the pinch of hard times comes round she repents. The same thing happens the next year, and the next, and we wonder if the time will ever come when our rural community will be guided a little more by business and a little less by custom.

Young Hens Pay Best.—There is another mistake which is fatal to success in egg-production, and perhaps it is

1st Year. 2nd Year. 3rd Year.

Comparative Profit from Pullets and Hens.

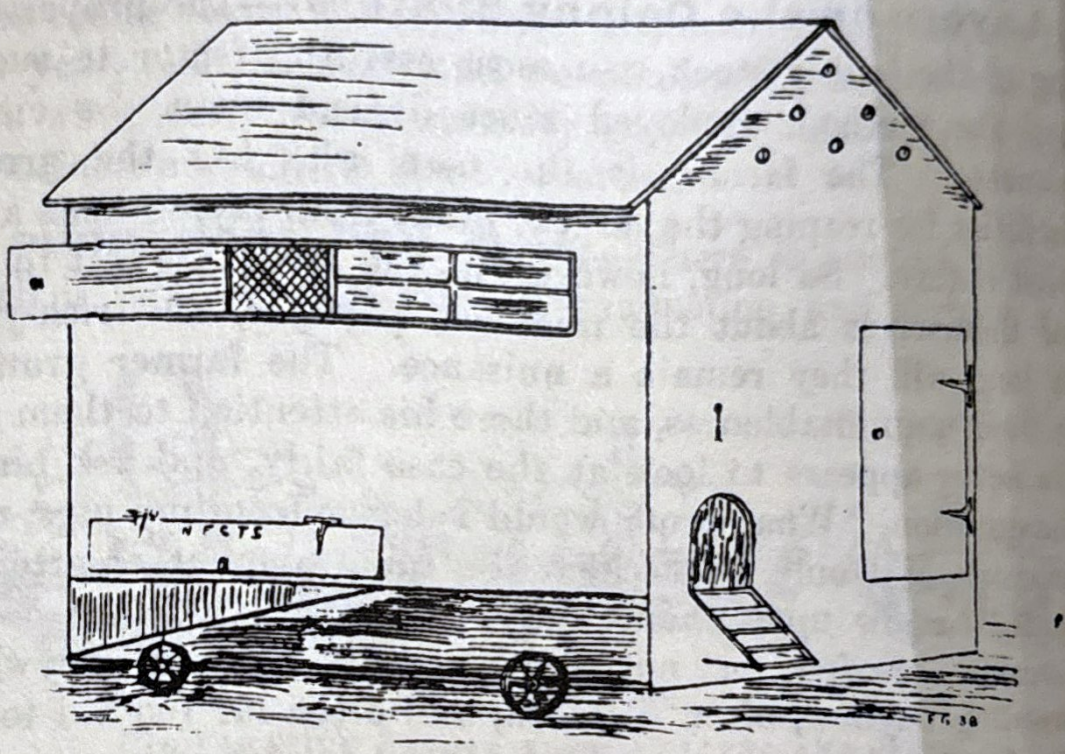
more common than any other: I mean that of keeping the layers after they have attained the age of two and a-half years. It is only courting disaster to keep hens after that age, unless they are of exceptional value as breeders. The most prolific period in a fowl's life is the first year of her existence, *i.e.*, while she is a pullet. It is true that some individuals will lay more eggs in their second year than in their first, but by June or July in the year following their second winter, they are past their best, and should be sold off for table purposes. As young hens they will at that time fetch a good price in the London market. When space is a consideration it is even wiser to dispose of the pullets at the age of fourteen or fifteen

months; that is, they are kept for the first winter's laying only, and disposed of early the following summer, to make room for the youngsters. This practice is a very commendable one from many points of view, and is becoming more universal year by year. The pullets are so young when sold, and good for another year's laying, that they will fetch but little less than their full value. The illustrations on page 26 showing the comparative number of eggs laid by a fowl in the different stages of her existence, speak for themselves.

Layers on the Colony System.—The proper housing of the laying stock is a most essential factor to success, and the method employed must depend upon the circumstances. The farmer is the man who has the greatest facilities for reaping the largest profit from laying hens at the least outlay. So long, however, as the latter are left to shift for themselves about the middens, pigstyes, and rick-yards, so long will they remain a nuisance. The farmer grumbles at their unprofitableness, and there his attention to them ends. He never appears to look at the case fairly, and ask himself the question, "What profit would I derive from my pigs, cows, or crops, if I only gave them the same amount of attention that I bestow upon the fowls?" The latter are, as a rule, outcasts, overfed, or not fed at all, roosting anywhere, breeding anyhow, often diseased, and often far too old to lay. The farmyard hens are condemned without a trial.

Movable Houses.—A few fowls may be kept about the farm yard to provide eggs for the household, but if the farmer be desirous of making money by egg-production, he must take his layers into the open fields, housing them in movable houses. The illustration (p. 28) of a movable poultry house gives one a tolerably good idea as to what these movable, or "colony" houses should be like. They must be well built and weather proof; ample ventilation must be provided, without draughts, and in the summer months a door of wire netting should be substituted for the wooden one used in winter. Many farmers, however, are dispensing with the

wooden door entirely, using one of wire only, outside of which there is a canvas blind, which may be let down at night or in cold weather. The whole side, or one end, of the house is sometimes canvased instead of being boarded. The canvas admits sufficient air, diffused through its pores, to maintain a pure atmosphere, and, one side of the house only being open (the whole of the remainder air-tight), there can be no draught. Fowls housed under such conditions always keep in the best of health, lay well, and roup and swollen faces are practically



A Movable Poultry House.

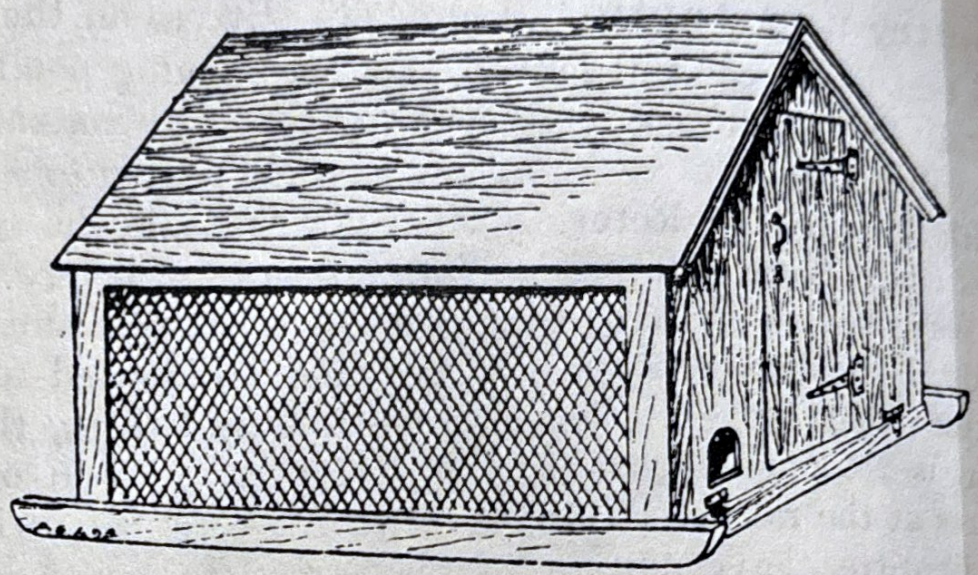
unknown. In the case of canvas being used a window will not be necessary to admit light, which is absolutely essential in a house which the layers may have to occupy for days at a time in hard winter weather. There must be ample room provided, and a house which measures 7 feet by 5 feet (on the floor) should not accommodate more than fifteen hens. A good layer of peat moss litter, dry earth, dead leaves, or shavings being placed to a depth of about six inches on the floor will provide scratching material, and, if kept dry, will remain sweet for three or four months, if turned over occasionally. A movable house should be as light as possible, consistent

with durability, and set on wheels with broad tyres to prevent sinking into wet land. Various types of colony houses are made, and in purchasing the beginner would do well to consider carefully such items as ventilation, durability, weight, construction, and size. Small houses, those capable of holding fifteen or eighteen hens, are to be preferred. Better results will be realised from two flocks in detached houses, than if they were amalgamated into one. It is not an easy matter to impress upon some people the fact that the smaller the flock, the better the average egg-yield per hen, but practice soon brings the truth home to those who put it to the test.

Poultry and Cattle.—I am fully alive to all the arguments that have been put forward against running poultry on the land. Nine-tenths of the British farmers still contend that cattle will not graze after fowls, and this old notion dies hard. Notwithstanding the lecturing of experts, and the object lessons which more enterprising farmers can lay before them, these conservative "tillers of the soil" still have an antipathy towards the feathered stock. If the land be stocked to such an extent that the grass has become foul and dirty, the objection is reasonable enough, but if layers are run on the pastures at the rate of about fifteen to the acre, they will not only improve the condition of the grass to an enormous extent by their manure, but the other stock will appreciate and benefit by the improvement rather than object to it. The fowls, when thinly distributed over the land, will lay better, their manure is the most valuable of any that is produced on a farm, and the intelligent farmer will not only, through his fowls, be making two blades of grass grow where one grew before, for the benefit of his cattle, but also be reaping an additional harvest of fresh eggs. This is not hypothesis, but fact, which is being proved to be true by hundreds of farmers in England and elsewhere, in ever increasing numbers, and who are ready to state how they are making a substantial addition to their income through the hitherto despised hen.

Houses set on Wheels or Runners are preferable to fixtures because they are more easily moved about and

taken from one part of the farm to another, so that the poultry will not interfere with the cropping of the land. As a general rule the flocks on the colony plan may be managed thus. During the winter they may run on the land intended for hay the following summer, or on the pastures. While the hay crop is standing, the houses may be put on the sheep walks, woods, or rough unused places. After the hay is harvested the aftergrass will provide an abundance of natural food that is most suited to the requirements of a laying hen, such as seeds, tender shoots of clover and grass, and insect life. As soon



Movable Poultry House on Runners.

as the first stubble is ready, the flocks should be turned upon it, when they will be able to pick up their entire subsistence for several weeks. During that time they cost absolutely nothing to keep, and they are daily producing eggs which, at that time of the year, are making a good price. I know of more than one farmer who hitherto always used to turn pigs on to the stubble, but since he has found out that laying hens make a far better return, the fallen grain is always reserved for them. I have seen movable houses, containing small flocks, wheeled on to the fields where ploughing is going on, the hens following the ploughs, and eagerly snatching up every wire-worm or larva that the upturned furrows disclosed. They do

A Sussex Poultry Farm.

an almost incalculable amount of good by devouring these injurious grubs, and the egg-yield from such diet is vastly improved.

Poultry Keeping by Farmers.—Thus the general farmer, above all others, has the greatest facilities for making a success of egg-production. The labour involved in moving the houses when necessary, in feeding and in other details of management, are reduced to a minimum, and he has the distinct advantage of being able to run the poultry in conjunction with other live stock. If he were to lay in a stock of layers, to average eight birds to the acre, he could do so without going to any extra expense as far as rent and additional labour are concerned. A strong lad could attend to 500 head of fowls on the colony system, with a little additional help occasionally in moving the houses, and he would still be able to give a portion of his time to other farm work. The laying hens on almost every farm in England could be increased a hundredfold, and, with proper management and intelligent feeding, prove themselves valuable adjuncts. The necessity of good strains, however, must not be lost sight of, and selection must always be an essential factor to success.

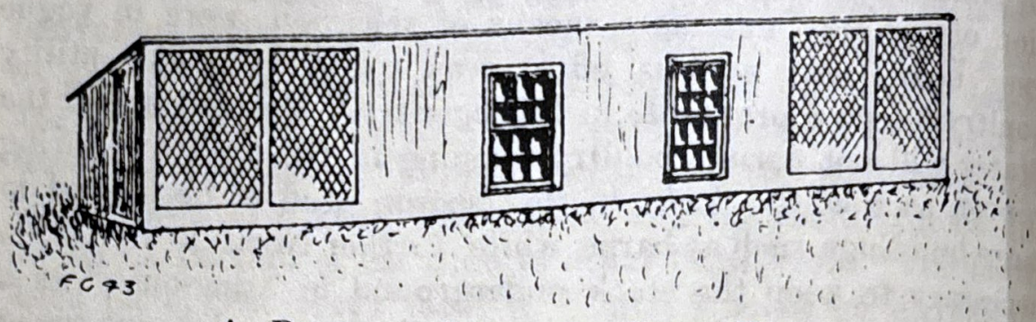
CHAPTER V.

SCRATCHING SHEDS AND HOUSES.

In America the scientific breeding for laying, and the adoption of the trap nest as a means of selection, were in vogue long before any serious effort was made to make utility poultry keeping profitable in this country. The climate of the States will not permit poultry keeping in the open air during winter, so that the flocks in that season used to be housed in large buildings, such as barns, while further North it was often necessary to keep the stock underground in "dug-outs," as a prevention of frost-bite. But the American did not want to merely keep his stock alive throughout the long winter without some return, so dry, light sheds were built, either detached and portable, or in ranges, into which the layers were placed in small flocks. The fowls had to be confined almost entirely during the winter. Litter was provided, and kept dry, and grain thrown amongst it. This encouraged the fowls to scratch, and so take exercise, which is essential to health and prolificacy, and on that account these buildings have since become to be known as scratching-sheds.

Best Type of Scratching Shed.—In this country the system is being adopted by nearly all classes of poultry keepers as a means of increasing the winter egg supply, and economising labour. The colony house, already mentioned, with its open wire front and weather curtain, is virtually a scratching shed, and provides comfortable, dry quarters for the birds during bad weather. The usual method, however, is to construct the house so that roosting place and scratching shed are separate apartments. The illustration shows us a type that has been largely used in America. The boarded

part in the centre consists of two roosting houses, each opening into a shed, with an open front of wire netting. A building of this kind can be extended to any length, and contain any number of houses, while the partitions may be provided with doors, so that the attendant can pass along the whole range with the least trouble. Runs can be extended at right angles, both at the front and the back, so that each flock may have the advantage of a change; and one run may rest and sweeten while the other is being occupied. A house such as



A Popular American Fowl House.

this should, of course, be built so that its open side faces south, to permit the winter sun to enter the sheds.

Other Types of Sheds.—There are many other plans that could be mentioned, and which are being adopted in this country. Some are extremely elaborate, and all cost more money in the fitting up than an English farmer would care to part with. They are more fitted for the specialist, who must be also to some extent a "capitalist." To be able to manage large numbers of laying hens on the scratching shed system in confined runs, requires an extraordinary knowledge of the subject, and an amount of business-like energy which is not, as yet at any rate, a common characteristic of English poultry keepers. Then our climate is very different to that of the States. It is damper, and there is often a difficulty in keeping the litter in the sheds dry. Even if protected against driving rain, the litter in the best sheds ever made will often be damp in prolonged wet weather,

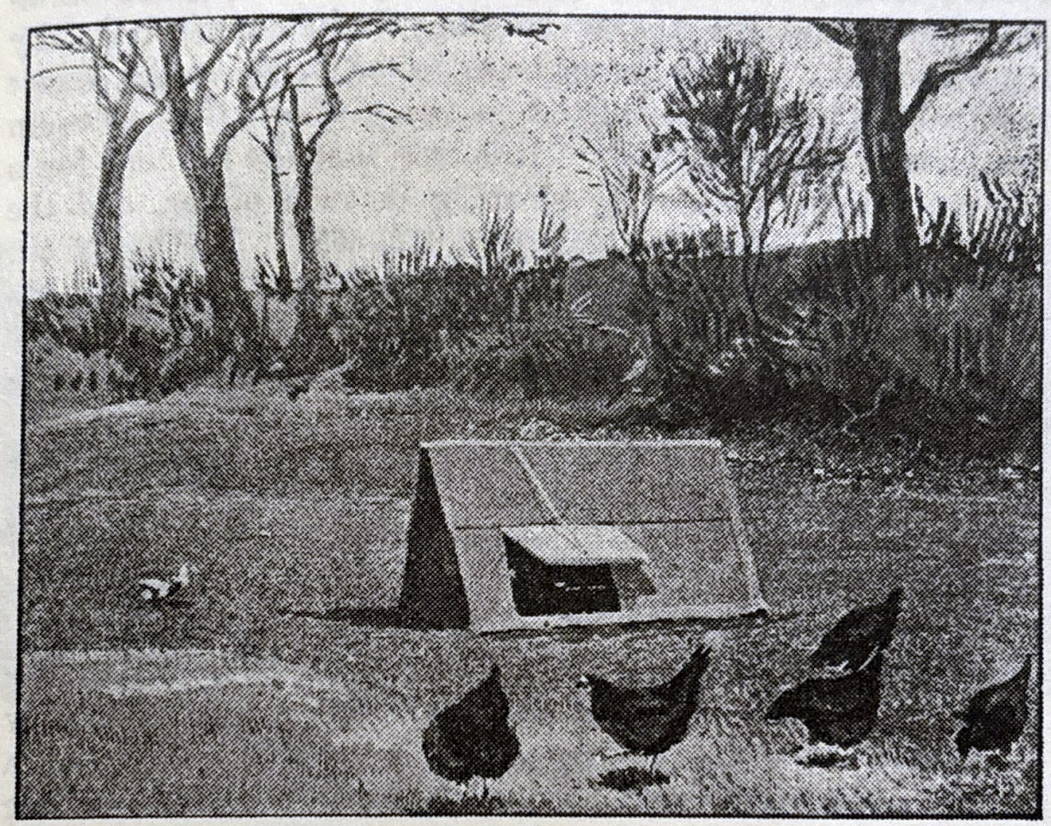
and once it becomes so, the advantages of the scratching shed are lost. It will remain sweet so long as it is dust-dry, but dampness will generate foul gases, and insect vermin will increase. I do not wish to convey the impression that scratching sheds are impracticable in this country. Far from it, but the system, if attempted on the huge American style, presents greater difficulties than appear on the surface, and if the beginner is led to believe that he must follow that style before he can realise success, he has been deluded. There are men in this country now fitting up these plants and working them for egg-production. They are men who know what they are about, and the results of their labours will be eagerly looked for.

Houses and Sheds Combined.—That better results in egg-production can be obtained in the winter months by the proper use of scratching sheds is well known, and the beginner who is about to set up in the business as a poultry farmer, pure and simple, could not do much better than lay out his ground with houses and sheds combined, each one being provided with two grass runs. I have already mentioned the advantages of providing two runs for each flock, and they cannot be over-estimated. Grass must be kept sweet by being allowed to stand for some months at least, and, if possible, by being mown. The hens, too, will appreciate and benefit from a change of scene as much as they will from fresh ground. While on a permanent grass run 100 square feet would have to be allotted to each fowl, the double runs should each be made of such a size as would provide about 70 square feet for each individual. Everything about the houses, sheds, and fences must be made with the view of economising labour, while durability is of the greatest importance. All gates and doors must not only be put in the most convenient places, but they must be made broad enough to allow a large crate or wheelbarrow to pass. Hinges, locks, and latches, too, appear to be minor items, but they will occupy time and cause worry to a busy man, as a poultry keeper must always be, if they are not main-

tained in good order. The floors of houses and scratching sheds should be raised above the level of the outside to promote dryness. The nests may either be in the roosting place or shed, but in either case are better placed so that they may be got at, by means of a small door, from the outside. Perches should be round, about two inches in diameter, resting in sockets, and so placed that they do not interfere with one's progress through the building. Tarring or creosoting the outsides will have to be done at least once a year, and roofs and walls seen to. The insides of the sheds, roosting places, and nests must be lime-washed frequently, and the perches dressed with paraffin oil, which kills the red mite and other vermin. During the summer months in particular, vermin will soon make the scratching sheds unbearable if the latter are not given the needful attention. If the poultry farmer intends devoting the whole of his land to laying hens, the most economical system to employ is the scratching shed and double run. I emphasise this fact, and in doing so may be accused of repetition, but knowing the disastrous results that have followed the stocking of the same land with more fowls than it can contain, year after year, and the falling off in the egg yield when no scratching sheds are provided in confined runs, I am convinced that some such scheme as I have briefly described is absolutely essential to success. There is a vast difference between the fowl on the colony system, with acres of land at her disposal, and her less fortunate sister whose space is limited to a few feet.

Poultry on Small Holdings.—As I have pointed out elsewhere, it is not the poultry farmers, in the ordinary acceptation of the term, who will ever make any appreciable difference to our egg industry. They may increase their ranges of pens and scratching sheds for the accommodation of "high pressure" layers, beyond the dreams of their most doughty champion, but it is the farmer, the small holder, and peasant whom we must look to as a nation for the greater bulk of our egg supply. I always avoid, if possible, going into figures, but are there not tens of thousands of English

acres, which, if they were only occupied by 10 layers each, might be producing over 1,000 eggs each per annum, without —and this must not be lost sight of—interfering with the other stock? It has always been my aim to encourage poultry keeping by farmers, cottagers, and gardeners. The man who sets up a poultry plant of scratching-sheds and runs is sup-



POULTRY HOUSE IN THE FIELDS

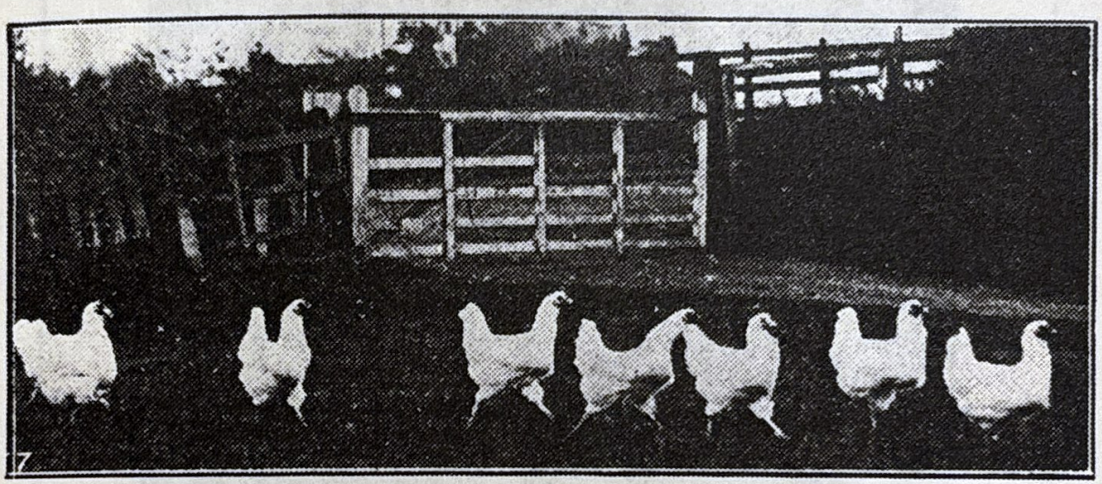
posed to know what he is about, and does not need advice. His system is an excellent one so far as it goes, but it will never be universally adopted by the bulk of our rural community, neither was it meant to be. We have briefly described the housing of layers on the colony system, in scratching sheds and confined runs on a large scale, and we have still to consider the accommodation for farmyard fowls.

Farmyard Fowls.—I do not advocate running large

numbers of laying hens about a farmyard witn a view to profit, but to keep a few to assist in swelling the egg basket, or to supply the household, and they will find a large portion of their own living and prove profitable. There is always waste food about a farmyard, and if there are not a few fowls to clear it up rats and sparrows will multiply. I have already mentioned the necessity for improving farmyard stock, and the proper housing of that stcok is hardly less important. Hens cannot be expected to lay in the winter months if they are permitted to roost where they like—in the trees or draughty sheds. It is true that the farmer's fowls are not always affected by sleeping in such places, and the top of a tree is better than a stuffy house. The hardy old barn-doors are the fittest that have survived in the struggle against the elements and bad management. The physically strong have survived, the weaklings being killed, either in chickenhood or later. But while nature has pursued her course of selection she has ignored prolificacy, and as a layer the "barn-door" is a failure, no matter how perfect her constitution may be. If she is required to lay, then she must not only be bred to do so, but she must be better housed. The vital energy and warmth which she utilised on her tree-top to preserve the heat of the body against the cold, will not be required for that purpose if she is properly housed, and may be used as a factor in egg-production. If a portion of a stable or cow-house could be partitioned off with wire netting or lattice-work, it would make an excellent roosting place. The warmth caused by the cattle will be a great incentive to winter laying, and the apartment being open would not get foul, provided the main building is well ventilated. Failing that, a disused outhouse or shed may be converted into a hen-house. The main thing to look to in fitting up such a place is the floor, which must be dry, and the walls and roof, which must be well plastered, or otherwise made draught-proof. In the case of an ordinary lean-to shed, it is desirable to board up half the open front, covering the other space with wire netting. The perches being placed behind the closed portion, will be out of the draught, while there will

be ample fresh air. In severe winter weather canvas or sacking may be drawn over the open wire. The floor should be well littered, so that it may be used as a scratching shed during the daytime, and the whitewash brush must be frequently brought into use.

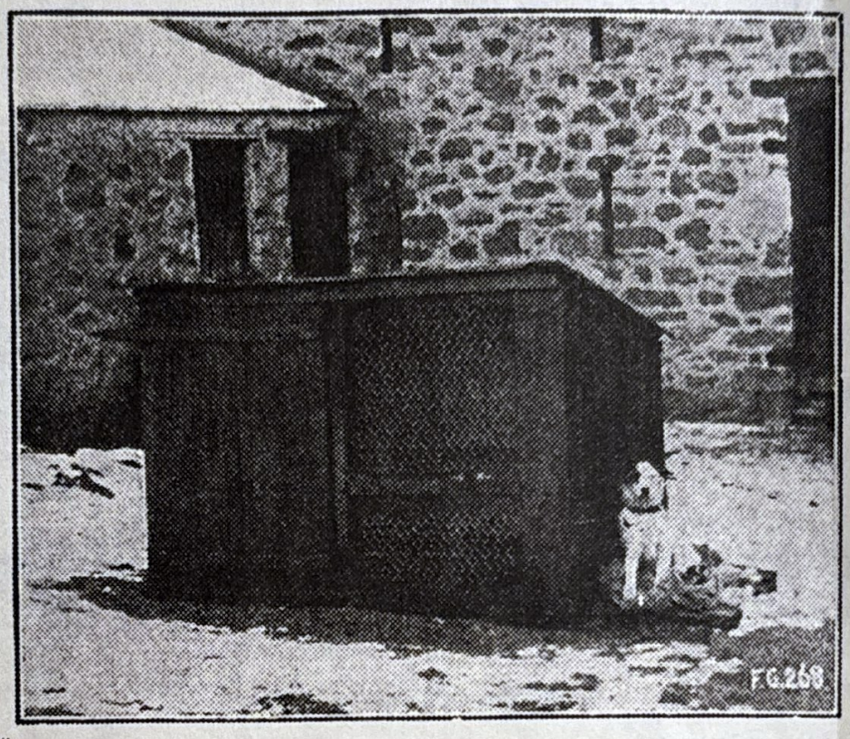
Cottager's Fowls.—The accommodation which the cottager's fowls have to put up with is no doubt the worst that it is possible to conceive, and those hens who are allowed the liberty of a road-side or small orchard, although their



PEN OF WHITE ORPINGTONS.

roosting house may be bad, are well off, compared with others who are condemned to mope away their days on a few square feet of cold, wet mud. The workman's fowls should be, and are in many instances a source of income to him. Eggs are a valuable food, and those not used by the family may easily be disposed of to neighbours in most places. The half-dozen or so hens can be almost entirely sustained by the refuse from the household, and, as a rule, the poor man's fowls are overfed rather than underfed. The plea of poverty is usually made when better accommodation is recommended for the fowls, but it is seldom a genuine one. If a workman can

buy a first-class bicycle, he can afford to buy a hen-house; or, if he can handle tools, he can with a very little outlay fit up a house and run during his evenings. It does not take any longer, probably not so long, to make a serviceable, hygienic house, than one that is unsightly, unhealthy, and which does not fulfil its purpose. Half-a-dozen hens may be housed successfully in a hogshead, provided it be well tarred



A Useful Chicken House.

and felted. Being somewhat small, however, the ventilation is an important item, and rather than have holes to admit the air as is very often done, I would prefer the door to be made as large as possible, and to be nothing more than a framework of wire netting. The nests, in the case of a house of this kind, are better placed outside. A house built on the principle of the Chicken House is eminently adapted for a few fowls, and may be bought in sections for considerably under £1. It has half the front open, so that it

may serve as a scratching shed in wet weather. There is a sliding shutter to regulate the open part in accordance with the temperature, or the shutter may be dispensed with altogether, and the more wholesome canvas or oiled muslin used instead

Laying out Small Runs.—The diagram (Fig. 1) gives an idea as to how a piece of ground in a garden or orchard may be laid out as a permanent fowl run. The house and shed (Fig.

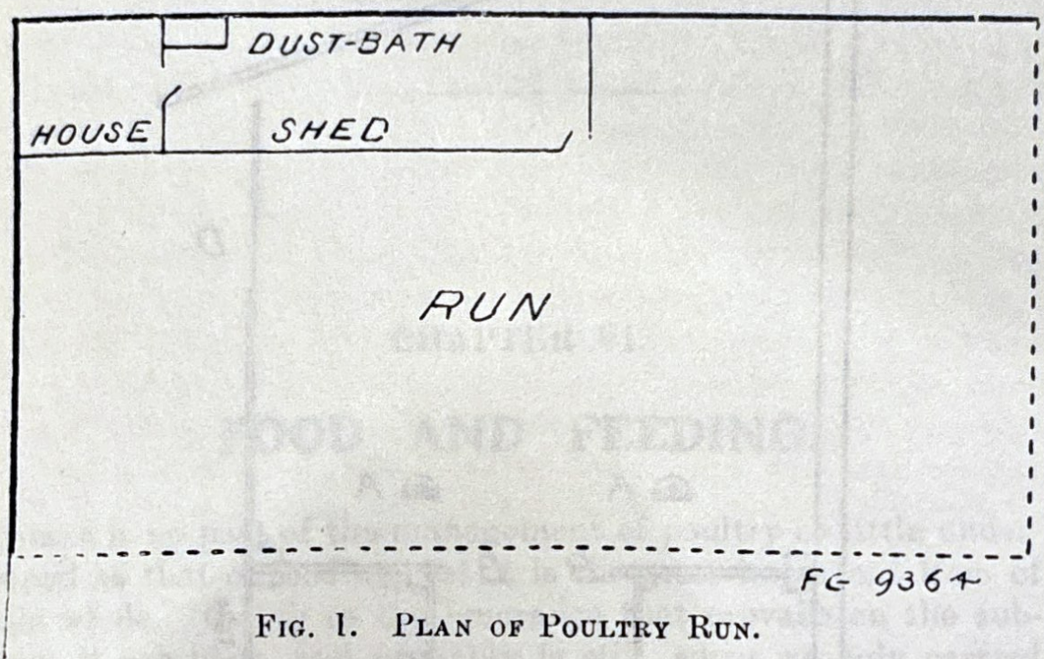


FIG. 1. PLAN OF POULTRY RUN.

2) may be of one elevation—a lean-to for preference—the former being closed in, but the latter open-fronted. The partition between the house and shed may be partly constructed of wood, but the door at least should be open. The shed which is provided for scratching exercise and shelter must be well covered with litter. If the whole area can be laid down with concrete or cement, so much the better. The interior of the roosting house may be constructed as shown in the illustration. D is a window, AA are the perches, so placed that a person may walk between them to reach the nests CC. The latter may be constructed by forming a dip in the

cement, and the addition of a little dry, soft material. Under the perches, and forming a roof for the nests, there is a broad plank so placed that it can be easily removed if necessary. If a little sand or dry earth be sprinkled upon it, the attendant may daily scrape off the droppings that have accumu-

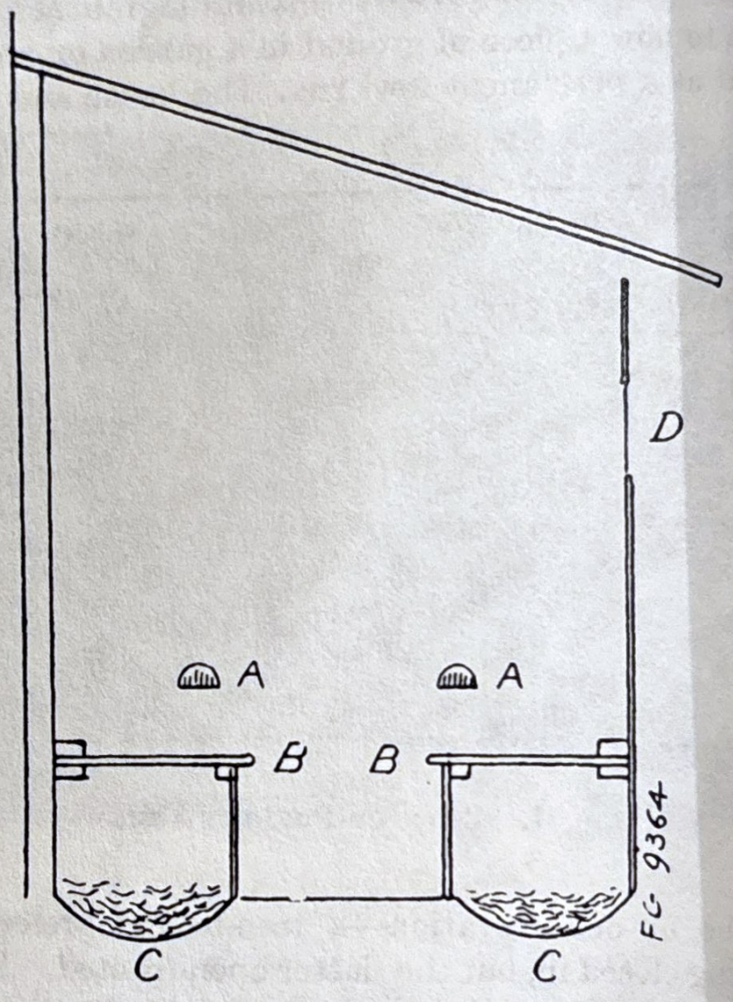


FIG. 2. SECTION OF POULTRY HOUSE.

lated during the night, and so preserve the cleanliness of the house for a longer period, and economise his labour and litter. These dropping boards may be used in any form of house, and are extensively employed in many of the American erections in which the fowls are confined for so many months at a stretch.

A Dust Bath, consisting of a box about one foot deep,

and filled with dry ashes or road dust, must be provided in almost every form of house or confined run. The only means that a hen has at her disposal of ridding herself of insect vermin is to shuffle in dust or dry earth. If the "litter" in the scratching sheds consists of the latter material a separate dust bath will not be necessary. Hens on the colony system, or on the free run of a farm, will select their own dusting place, but a properly constructed "bath," placed in a sunny spot, is a necessity in all other instances.

CHAPTER VI.

FOOD AND FEEDING.

THERE is no part of the management of poultry so little understood as that of feeding, yet it is the most important item of the whole. Owing to the ignorance that prevails on the subject, it has been, and probably is still, when wrongly carried out, the cause of nine-tenths of the failures, diseases and deaths with which so many a beginner has been confronted. To grasp the subject properly it is essential that we should first ask ourselves the question—

What is Food?—It is that which replenishes a body with those elements which are constantly being consumed in the changes that are continually taking place in the living tissues. The consumption of material must be balanced so that the body may preserve its normal state. If the body works it requires more food to recompense it against loss, which exercise promotes. In the case of a young animal whose body

is growing, still more material will have to be provided for the formation of bone and muscle. Food is necessary as fuel to sustain the heat of the body, and the latter will store up reserve supplies in the form of muscle and fat, to be utilised in the case of hunger or disease. If the organism has to provide for the sustenance of its offspring, as in the case of milk or eggs, it must have so much additional food, beyond the requirements of its own body, to enable it to do so. The elements of which an animal body is composed consist mainly of nitrogen, carbon, oxygen, hydrogen, and mineral matter. The most important of all these is nitrogen or albuminous matter. It is present in flesh, insect life, grain, seeds, vegetable matter, and the white of an egg, the latter being almost pure albumen and water. Nitrogenous matter is mainly utilised in the formation of flesh and bone, and in replenishing the waste tissues of the body. Carbon, oxygen, and hydrogen, which for convenience we may bracket together under the term carbonaceous, are wanting in nitrogen, and contain an excess of carbon. Starch, obtained mainly from grain and potatoes, fats, and oils, and sugar, all come under this heading. Carbon is instrumental in supplying fuel for the combustion going on in the body. If food of this kind be provided in excess, abnormal fat will result; on the other hand, if it be withheld, the reserves of the body will be utilised, or the albuminous matter exhausted. Mineral matter, such as lime, salts, sulphur, and phosphorus, are necessary for the formation of bone, feather, egg-shells, and assisting the digestion. Water is present in all foods, and, as it composes so large a portion of the animal itself, is of the greatest importance.

Relative Values of Various Foods.—With these four classes of foods before him the poultry keeper will not only understand that true economy in feeding can only be attained by giving just those materials which the requirements of his stock demand, but he will grasp the fact that an ordinary healthy life cannot be maintained without a judicious combination of foods from each of these classes. He now has

a base upon which to work. The Table of Foods given at the end of the book will enable the beginner to see at a glance the relative values of the principal food stuffs that he will handle, and by its guidance he may balance his daily rations. The proportions of the albuminous or flesh-forming foods to the carbonaceous or warmth-giving should be, under normal conditions, one part of the former to about five of the latter, but this proportion may, and must, under certain circumstances, be varied, as we shall see. The table shows how a diet of potato alone would promote fatness, how wheat and Indian corn alone are poor in nitrogen in proportion to starch, and how rice, deficient in bone-making material, albuminous matter, and fat, would be a "starvation" diet for a laying hen, or a growing chick, if not mixed with something else. In oats or oatmeal we find the proportions of albuminous to carbonaceous matter about right for the maintenance of a hen in perfect health. Middlings, thirds, or fine sharps are also rich in nitrogenous compounds, while peas and beans are the richest of all. Now supposing the fowl to be provided with a diet, such as ground oats, which is sufficient to maintain her health and strength under normal conditions of surroundings and temperature, it follows that if she were subjected to any great alterations in these conditions, then the diet would have to be adjusted accordingly. In severe weather, for instance, more carbonaceous or warmth-giving food will have to be added to the fare, and if the hen is expected to produce eggs, she will have to be provided with that amount of albumen and fat which an egg contains, over and above that which she utilises in the preservation of her own body. Layers, therefore, require special feeding, which also varies with the conditions under which they are kept.

Albumen required by Laying Hens.—An average egg weighs 2 ozs., a large proportion of which is water. The greater part of what remains, however, is pure albumen and fat, and we may say, to be well within the mark, that a laying hen has to produce 1 oz., at least, of pure albumen, fat, and mineral salts, every time she lays an egg. She must get

albumen if the egg supply is to be maintained, and it must be given in accordance with the circumstances.

Food for Layers in Colonies.—Let us first take the case of the hen on the colony system, or in the farmyard at liberty. During the greater part of the year, say from March to October inclusive, she will be able to pick up the greater part of her own living. Grass, clover, seeds, insects, and worms will be searched for, and all these, more particularly the latter, are rich in nitrogen. A hen that is in full lay, at liberty, will be always active, hunting after that food which her instinct teaches her is essential to her requirements. She will eat nearly double the quantity of food that would suffice for another individual who is not laying, under such conditions, and during the months given above, one moderate feed of grain per day will suffice. Oats, which must be short and heavy, should be given in preference to any other, but small, hard wheat will be useful as a change. The quantity to use must be varied according to the weather. Under normal conditions a handful (grasped with the palm downwards) will be about right, and enough for each hen. Supposing, however, the weather to be so bad that the fowls cannot get out, a light feed may be scattered in the scratching litter in the shed or colony house. The birds will occupy themselves in scratching for the grain, and by so doing will not develop such vices as feather-eating or egg-eating. As the moulting season comes round, a feed or two of maize may be given for a change, particularly if the autumn be early, cold, and wet. Pullets of the year, of course, will need feeding more liberally, and towards October may be forced with a little extra meat or cut-bone. The latter, sometimes called "green bone," is a most valuable egg-producer, and may be used in preference to meat, which also is highly nitrogenous. All poultry keepers who are able to obtain fresh bones should obtain a bone-mill, which will soon pay for itself in the additional egg-yield. Much of the "green cut bone," advertised does more harm than good. It must be freshly cut as it is wanted, at least, in warm weather. With the advent

of November, pullets and hens of the previous year may be fed alike, and on free runs two meals will have to be given. As to whether the first meal of the day should consist of soft or hard food there exists a difference of opinion. The advocates of the former contend that a hot meal or mash in the cold morning imparts a warmth to the body and enables it to resist cold, while the champions of a morning feed of grain, aver that the warm food causes sluggishness and drowsiness during the time that the hens should be about and active. As is often the rule in such arguments, the truth may generally be found between the two lines, viz., soft food in moderation serves its purpose of promoting warmth, and after the fast of a long winter's night it sooner passes into the body from the crop than hard corn, thus relieving hunger in a shorter time. The hard corn, too, in taking longer to digest is better able to sustain the body during the fourteen to sixteen hours of darkness. A good standard diet may consist of ground oats and middlings in equal parts, mixed with boiling water and given hot. If the hens are in full lay, cut bone, or meat, may be added to this, in quantities varying with the state of the weather. It should be mixed into the meals, allowing about 5 lbs. to 6 lbs. to every 100 hens, in normal weather, increasing the quantity with a lower temperature. If very cold, cracked maize may be used for the evening grain. Beginners, and even "old hands," more often make a mistake in regulating the quantity of the food rather than the quality or composition of it. No given amount could be mentioned that will suffice for a given number of hens under all conditions. A hen that is laying will eat 2oz., and more, of cut bone daily, and do well on it, whereas, if another individual that was not producing eggs eat the same amount, the stimulating diet would become injurious. Fat would accumulate in the system, and the liver probably become affected. We will suppose that an ordinary "margarine" bucket of mash to suffice for 100 layers, on a genial day in winter, but if the weather were to become suddenly colder that amount would have to be increased in quantity. Warmth-promoting food will have to be added to counteract

any effect that the weather might have upon the egg supply.

Careful Feeding Essential.—The poultry feeder will have to use his observation if he would be successful. If he begins with a carefully drawn-up menu, and a set of rules which "altereth not," he will soon discover his mistake. "Sufficient for the day," is a good maxim for the feeder in a climate such as ours. The appetites of the hens may be taken as a fair indication of their wants, although it is not always reliable, from the fact that some hens, more particularly in confinement, will eat themselves to death, and enjoy the process. The hens should always be eager for their food, but their appetites should never be fully satisfied. If any food is left, less must be given next time. Soft food left in the troughs not only indicates bad feeding and over-feeding, but waste. It also attracts vermin, in the form of rats, mice, and sparrows. Hens that have gorged themselves to repletion. will huddle about in corners, or return to their perches, and such hens will never lay satisfactorily. Over-feeding, as I have remarked before, is at the bottom of the majority of the complaints that one receives from people who cannot get their hens to lay in winter. It is also the cause of untold numbers of diseases. Indiscriminate feeding, *i.e.*, the feeding of all stock, irrespective of their requirements, on the same kind of food is a mistake. When this is done there must be waste or disease somewhere.

Change of Diet Beneficial.—Poultry appreciate and benefit by a change of diet as much as we do ourselves, and the following mixtures may be given as morning feeds besides that one already mentioned:—

(a) Boiled potatoes and good broad-flaked bran. The latter must be good, otherwise it is injurious, and it is best mashed into the potatoes while they are yet hot, after draining off the water. A little linseed meal may be added to this in very cold weather.

(b) One part maize-meal to two parts of good bran is

another very cheap mixture. It should be well scalded, and may have extra fat added or not, according to the temperature.

(c) Boiled vegetable, such as cabbage, onion, and turnip, mashed into a crumbly state with ground oats, and the addition of meat or cut-bone.

(d) Malt sprouts and middlings in equal parts and barley-meal two parts, given hot.

Meat or Cut-bone may be used in addition to those mixtures which do not contain either, and the feeder must use his own judgment on the matter. There are few days in winter, however, when a little cut-bone is not a distinct advantage. The meals given above may suit layers whether at liberty or in confinement, always bearing in mind the fact that, on a free run more food can be eaten without injurious results than in close confinement, where fattening or warmth-giving foods must be used with care.

Cut Clover, or Clover Meal, is becoming very largely used as a food for layers, and owing to its highly nitrogenous character good results are obtained from its use. It should be scalded over-night, and mixed with either ground oats or middlings, adding cut bone as required.

Green Food.—Fowls kept under any conditions derive great benefit from a good supply of vegetable matter, and this may be given boiled in the morning mash or in the runs at midday. If the poultry keeper were to invest in a food cooker or "steamer," he would find that it would economise his food considerably. All kinds of vegetables and a due proportion of meat and cut clover may be put into the cooker over-night, and by the morning everything will be warm and nicely cooked. It may then be turned out into a shallow tub, and the dry meal mashed into it until the whole becomes crumbly and friable.

Distributing Soft Foods.—The labour of carrying soft food to distant colonies of layers on a farm is great, but be-

fore the coming of winter the houses should be brought as near the homestead as possible. The best means of carrying the soft food is, not in buckets, but in a galvanised iron wheelbarrow, which may be large enough to carry sufficient for the whole round, and will be less laborious. Put the food in troughs when the land is wet or muddy, otherwise I prefer to throw it on the grass. The hens like it better when it breaks up on the turf, than when it is compressed into a lump in a trough. Trough-feeding, however, should always be adopted in confined runs, both for soft and hard food. In fine weather, when the fowls are at liberty, the grain may be scattered far and wide over the turf, using a fresh plot on each occasion. The fowls thus get employment and eat their food slowly, grain by grain, as nature intended them to do, and the field derives considerable benefit from the scratching and more even distribution of the manure.

Exercise.—I have already mentioned the necessity for promoting exercise in laying hens, under all and any conditions, not only as a prevention against disease and vice, but as an incentive to laying, and how scratching may be encouraged in bad weather by scattering or burying corn in the sheds. The latter must not, in any case, be overdone, but enough to promote scratching, and to reward the hens for their labour, is all that is required.

Use and Abuse of Maize.—A word at this point on the subject of maize will not be out of place. This much used, yet much abused, cereal has been the subject of more controversy than any other poultry food. It is cheap, greedily eaten by fowls, very stimulating and heat-producing, and unless there is a sufficient amount of exercise taken to counteract these effects, it causes abnormal fatness and disorganises the liver. Maize, in itself, does not and cannot cause liver disease or tuberculosis, but it is only reasonable to suppose that if the liver becomes disorganised by an over-stimulating diet, it would sooner fall a prey to the tuberculosis bacilli than a healthy one; and as the disease is so prevalent, and

apparently on the increase, it behoves us to do everything in our power to check it or, at least, avoid it. Hens in confinement should rarely be allowed maize, but those on high altitudes and at liberty, in exposed places, can be allowed a fair proportion with distinct advantage. It may be avoided in hot weather in any case. It will be gathered, then, that the question of maize feeding must be left to the judgment of the individual feeder, who must use it in accordance with the circumstances.

Miscellaneous Foods.—There are many other foods, such as biscuit-meal, buckwheat, sunflower-seed, bread, and dari, all of which are excellent at times, but I have endeavoured, in the space at my disposal, to give the beginner a general idea as to how to use the commoner and cheaper meals to the best advantage. He must watch the market and buy when cheap, if possible. Inferior qualities are uneconomical in the long-run, no matter how tempting the price may sound. Finally, whatever the food may be, the beginner must use his judgment and observation in considering the season, temperature, and condition of his stock.

Grit.—Before concluding this part of my subject mention must be made of grit, lime, and water, which are as essential to a fowl's health as food itself. Grit, which consists of small stones, gravel, or broken flint, or quartz, is to a fowl what teeth are to a man. The grit is swallowed and passed into the gizzard, where by a muscular action the food is ground up by the sharp, hard stones. These stones, or grit, will remain in the gizzard, performing their functions for a considerable time, that is, until they are worn round and smooth, and are of no further use. Fowls on an open range can usually find sufficient grit for their requirements, but those in confinement must be regularly supplied with it. A hen without sharp grit cannot digest her food, with the result that she soon becomes diseased. There are many excellent grits now on the market —at prices ranging from 4s. to 5s. per hundredweight—and most poultry keepers will find it more convenient to buy this

ready prepared. Where flint abounds, however, first-rate grit may be easily produced by heating the flints until red-hot, and then immediately throwing them into cold water. The pieces can then be easily broken up, either in a crusher or with a hand-smasher. For the sake of economy, the grit should be placed in shallow boxes in the runs.

Lime, in the form of old mortar, oyster or other marine shells, must also be supplied, not only to provide the hen with material for making egg-shells, but with the mineral salts so essential to robust health. The best form of lime is shell, but new mortar or quicklime should be avoided like poison. When green cut-bone is fed, it will provide all that is necessary in the form of limy matter. Egg-shells may be given to the fowls, but not in their usual state, on account of the tendency they may have to encourage egg-eating. Bake them in an oven, or before a fire, for a minute or two, and they may then be easily broken up into small pieces. Grit or shell should never be mixed into the food, but given separately.

The Water Supply is not less important than the foregoing. While water is absolutely essential to the well-being of a fowl, it may be the means of transmitting disease from one individual to another, if not the actual origin of the disease itself. The great fault, however, is in not keeping the water fountains always filled. If they are allowed to get dry the fowls drink to excess when the opportunity occurs, and trouble follows. Water should always be kept in the shade, out of the rays of the sun, and, in the winter, where snow may not mingle with it. The vessels should frequently be scoured out, and only those fountains used that are easily cleaned inside. A regular supply of pure, cold water will, under these conditions, be a preservative of health rather than a source of disease.

Spices.—The use of spices or stimulants in feeding poultry is often carried to an excess which leads to disease. When a good diet, and a proper proportion of meat or cut

bone is being fed, spices are seldom necessary. In the case of a sudden lowering in the temperature, a warming condiment is useful in warding off roup and maintaining the egg-supply, but to use hot stimulants, such as cayenne, regularly often does more harm than good. Pullets may be forced with stimulants into early and continuous laying, and if the birds are only required for one winter, such a plan may be commended. The constitutions of the layers would, however, be ruined for further use. The following is a powder that may be used judiciously to prevent colds and to promote laying in severe weather:—

2 ozs. aniseed;
2 ozs. liquorice;
6 ozs. fenugreek;
3 ozs. gentian;
2 ozs. sulphate of iron;
1 oz. cayenne.

The above ingredients should be powdered and well mixed into 1 lb. of white thirds. The food should be slightly seasoned, or about a teaspoonful allowed to every six hens.

CHAPTER VII.

MARKETING EGGS.

Eggs should be collected at least once a day, and if any are stained or dirty they should be washed before being put away. The shell of an egg is porous, and the contents will absorb almost any taint that the egg comes in contact with. To test this, put an egg in a basket of onions for a day and, when boiled it will be found to have acquired the flavour of the vegetable. For the same reason they should never be packed in mouldy hay or straw, or, in fact, anything that has a distinct odour.

Testing Eggs.—The eggs ought to be despatched to the market or consumer at least twice a week in winter, and three times a week in summer. If there is any doubt as to their freshness, they should be tested by means of a candle and the hand-tester shown in Figs. 1 and 2. A fresh egg should be clear and translucent when held in the centre of the tester between the eye and the candle in a dark room; any that show a dark spot, a general opaqueness, or a heavier

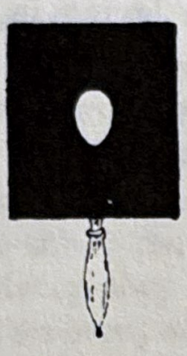


Fig. 1.

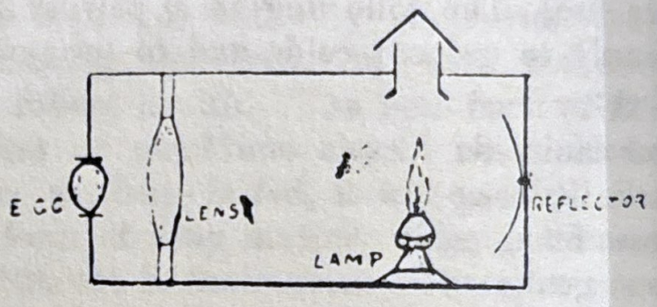
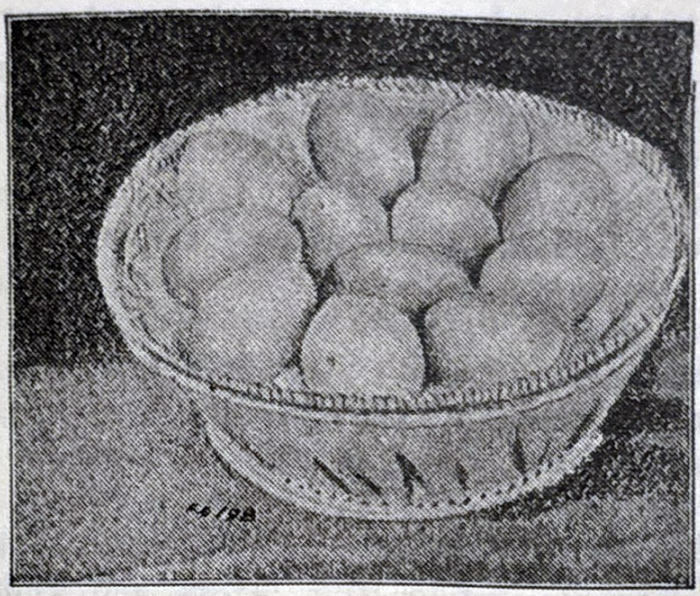


Fig. 2.
Egg-Testing Apparatus.

shadow on one side than the other, should be discarded. The air-cell in a fresh egg is small, but experience in testing shows that the size of this cell increases with the age of the egg. With a little practise it is quite possible to test an egg when held between the forefinger and thumb before a strong light. No risks should be run, however, in this matter; it is better to discard a doubtful egg than place it among a crate of reliable ones.

Grading Eggs.—Eggs should always be graded according to size—large, medium, and small—and according to colour. If all sizes and colours are jumbled into one lot, they will only fetch the price of the smallest and lowest quality. A testing board containing three holes of different sizes, through which the eggs must pass, may be used in grading, or metal rings may be obtained to serve the same purpose. Brown eggs may be kept apart from the white ones, for they will fetch a better price. Good eggs should average 2 ozs. each, or about 15 lbs. per long hundred (120). Occasionally

the weight is greater than that, but it should certainly not be allowed to drop below it in the first-quality consignments.



A Good Sample of Eggs.

The price is largely decided by weight in the wholesale trade, and it is fairer for all parties that it should be so.

Packing Eggs.—Packing is another most important department. If small consignments of eggs only are sent, patent boxes are better than crates, and the former will be more useful to the great majority of poultry keepers in this country, where organisation is only in its infancy, and really large consignments of eggs an impossibility. Patent boxes are safer, easier to pack, and there is no likelihood of the eggs acquiring a flavour of straw or hay, as is so often the case with crate eggs.

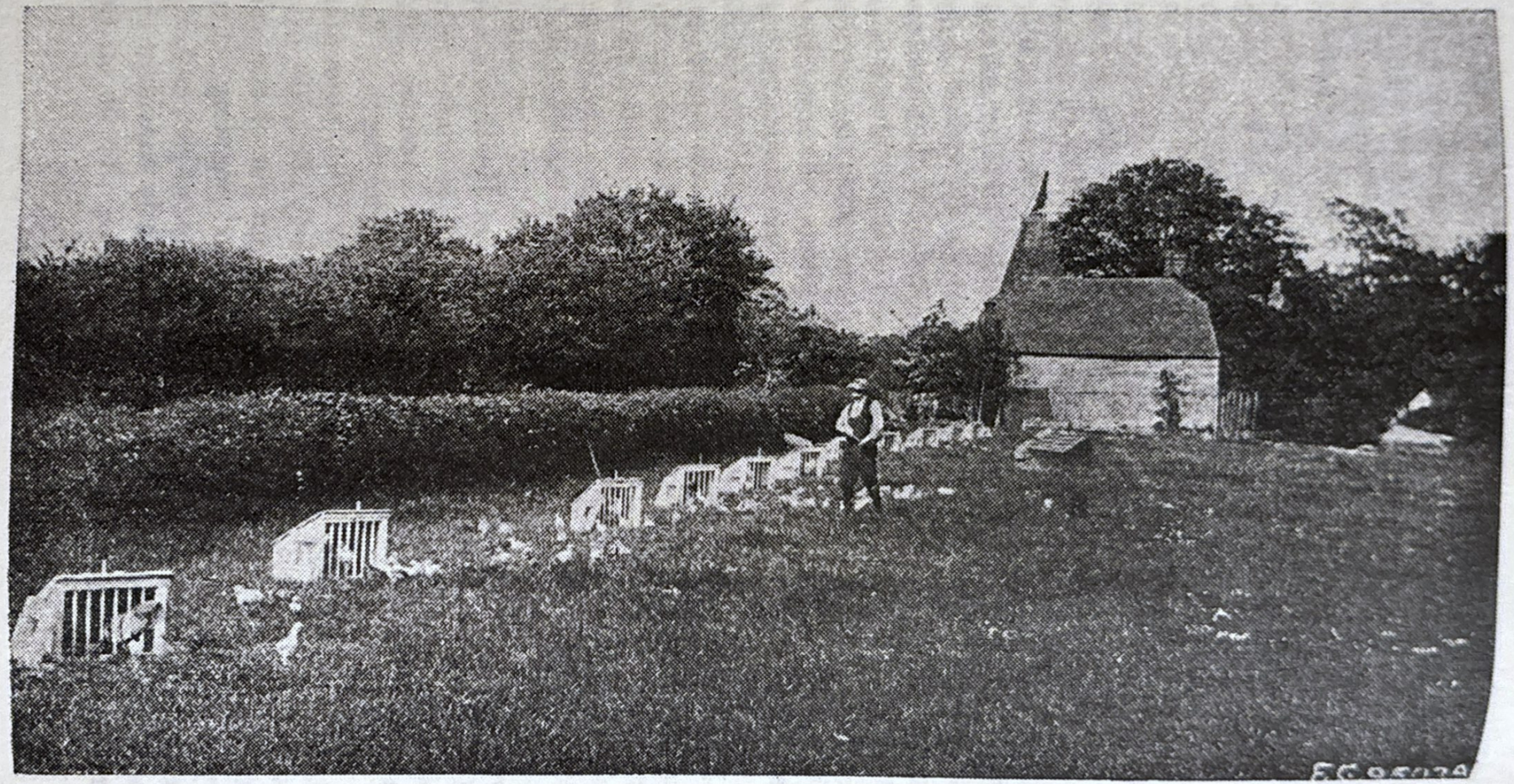
Stamping Eggs.—If the producer would stamp every egg with a private mark and the date, it would go a long way towards establishing his reputation, and he would run no risk of being accused of selling bad eggs which really may not have come from him at all. In many places, too, he would obtain a better price for the eggs which are stamped as a guarantee of their quality.

How to Market Eggs Successfully.—In summing up this part of my subject, I trust I have made it clear that, to make a success of egg-production, the layers must be above the ordinary; they must have been selected and bred for laying. Putting the cost of a hen's keep at three-halfpence a week (it is usually much lower than that) it will be seen that, unless she lay 100 eggs in the course of twelve months, she will not be yielding much profit after all expenses of food, labour, interest on capital, rent, and losses are taken into account. But if she be induced to lay 150 to 170 eggs per annum, the profit is very satisfactory, supposing the management to be good. Then the layers must be fed to lay, and not given food indiscriminately. Shelter and exercise are essential to winter laying, and must be provided in accordance with the circumstances. We have seen that while the farmer and cottager are possessed of the greatest facilities for making a substantial profit from layers, and while it is to them that the nation must look for any marked advance in the home egg industry, there is a wide field open to the specialist who is sufficiently well equipped with capital and knowledge to set up a "pure and simple" poultry farm. The prospects for poultry keepers were never better than they are at present, and the encouraging example set by earnest workers should lead others to do their share in raising this profitable industry into its proper place among our rural occupations.

CHAPTER VIII.

TABLE POULTRY.

If we look at the table poultry industry as a whole, we find that it is in a lamentably backward condition. With the exception of those large establishments where fattening poultry for market is the main and only object, the industry scarcely shows any signs of improvement, and, as in the case of eggs, the foreigner is supplying what we have failed to do ourselves. Every poultry keeper, even if his aim be egg-production, or exhibition stock, has a surplus, such as cockerels, or mismarked birds, to dispose of for consumption. Every farmer and cottager who keeps a few fowls has some broods to part with, and if we take these facts into consideration, letting alone the tremendous output of fattening establishments and foreign importation, we may gather some idea as to the value of poultry as a national food. In a report to the Royal Commission on Agriculture, on the poultry industry of the Heathfield district of Sussex, in 1895, it was stated that in one year, 1,850 tons of table chickens, valued at about £200,000, were marketed from the districts of Heathfield and Uckfield alone. This industry is not confined to Sussex only, but is extending all over the South-Eastern counties, Midlands, and the more populous districts of the north. The imports of table poultry (including game), in 1902, amounted in value to £1,059,000, an increase of nearly £80,000 over those of the previous year. What the total out-put of our own country amounts to we have no means of guessing. Our Government does not issue any returns on the subject, and, unlike those of most European countries, evidently considers the industry so small as to be beneath its notice. To be on the



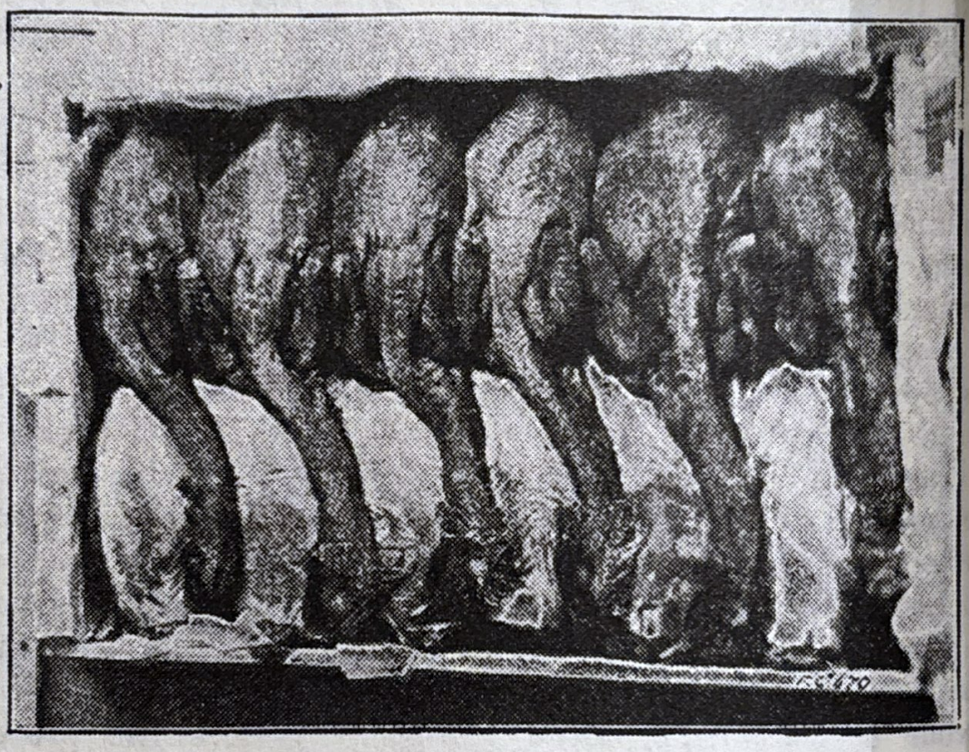
A KENTISH CHICKEN-REARING FARM.

safe side, however, we should not be overdrawing the mark in putting down the value of the poultry and egg out-put of this country, at the very lowest estimation, at not less than ten million pounds per annum. Surely this amount, as representing a rural industry, is sufficient to demand some recognition on the part of the Government.

Quality not Quantity Needed.—It is not the quantity of table fowls, as produced on farms and by cottagers, but the quality of them that is so much in need of improvement. The specimens that are sent to the country market are little better, often not as good, as those bought by fatteners as "lean chickens." They are not only lean but often coarse and bony; they are puffed up in the trussing and look fairly respectable. The public are satisfied with them, and why? Because they have never had anything better. Their palates have not been educated to appreciate a properly fatted fowl, and they are content to pay 2s. to 2s. 6d. for their indifferent specimen, rather than 3s. or 4s. for a large, properly fed, good quality fowl, which probably carries as much meat, and that of a better quality, as can be scraped off a couple of the smaller specimens. The consumers are as much to blame in this matter as the producers. The former, however, are slowly "coming round," and in many provincial towns a better class fowl is in greater demand than it used to be. There is much to be said in favour of fattening poultry. Not only does the process increase the weight, but the quality and colour of the flesh is vastly improved. A fattened fowl also has a larger amount of meat in proportion to bone than a lean one. We all recognise the necessity for, or at least the great advantage, derived from fattening pigs, sheep, and cattle. Why, then, are we so backward in practising it with our poultry?

The Question of Breed is an important one in this connection. All the fattening in the world will not make a respectable fowl of some of our smaller or degenerated farmyard stock. The system of marketing can be improved upon,

and better prices obtained in many parts of the country than those which are given by "higglers" or collectors. The latter are still giving the same prices as they gave years ago, so long as the producers—cottagers and farmers—are kept in ignorance of the state of the market. As a matter of fact prices, on the whole, have been on the increase, especially in provincial markets. The chickens must be hatched earlier in the year, and the old practice of letting the whole responsibility



American Fowls, Packed in a Shallow Box.

of nesting, hatching, and rearing rest upon the hen must be dropped, and a more economical method employed. Profit will not be derived from poultry, if neglected, any more than it would from a fruit orchard if allowed to take care of itself.

The Difficulty of Regular Supplies.—There is a great difficulty in obtaining anything like regular supplies of poultry from rural districts. The producers have not

awakened to the fact that unless they keep up a regular supply, they will lose their market and hand it over to the foreigner. Already the foreign poultry is a serious competitor in the London, as well as provincial shops, and the only effectual way in which we can hold our own is by turning out a better class of fowls. The foreign article cannot compete with our best qualities, but our second and third rate supplies have been hopelessly crushed. There was a time when "spring chickens," about the size of pigeons, could be disposed of in our shops, not so now. The larger and better Russians or Canadians, which have been kept in a "cold storage" since the preceding summer, are in possession of the poulterer's slab. If we want to do a spring chicken trade, therefore, we must produce something equally as good, or better, than our frozen rivals. It can be done and is done by those who know their work. Briefly, we must keep more suitable breeds; hatch earlier; feed better; market more regularly; and let the consignments be characterised by good quality, cleanliness, and proper packing.

The Best Breeds.—I have already mentioned the fact of the wide difference that exists between some of our different breeds from a table point of view; let us see wherein this difference lies. First, what constitutes a first-class table fowl? In judging a class of table poultry, what does the judge look for in the specimens displayed before him? Size appeals to most people, but it is not everything. The breast bone must be straight, not broken or cut, and long. It must be well-filled, or covered with meat on either side. The wings should be fleshy, and the bone throughout fine. The skin should be fine in texture, and the colour, white preferred, even throughout. The skin or flesh must not be torn or bruised, and cleanliness, of course, is essential. The back should also be well covered with meat and free from deposits of yellow fat. The decided preference shown by most people for white-skinned, rather than yellow fowls, is nothing more than a prejudice or a fad. A yellow-tinted fowl is often equally as good as a white one, and in America, that country of advanced poultry

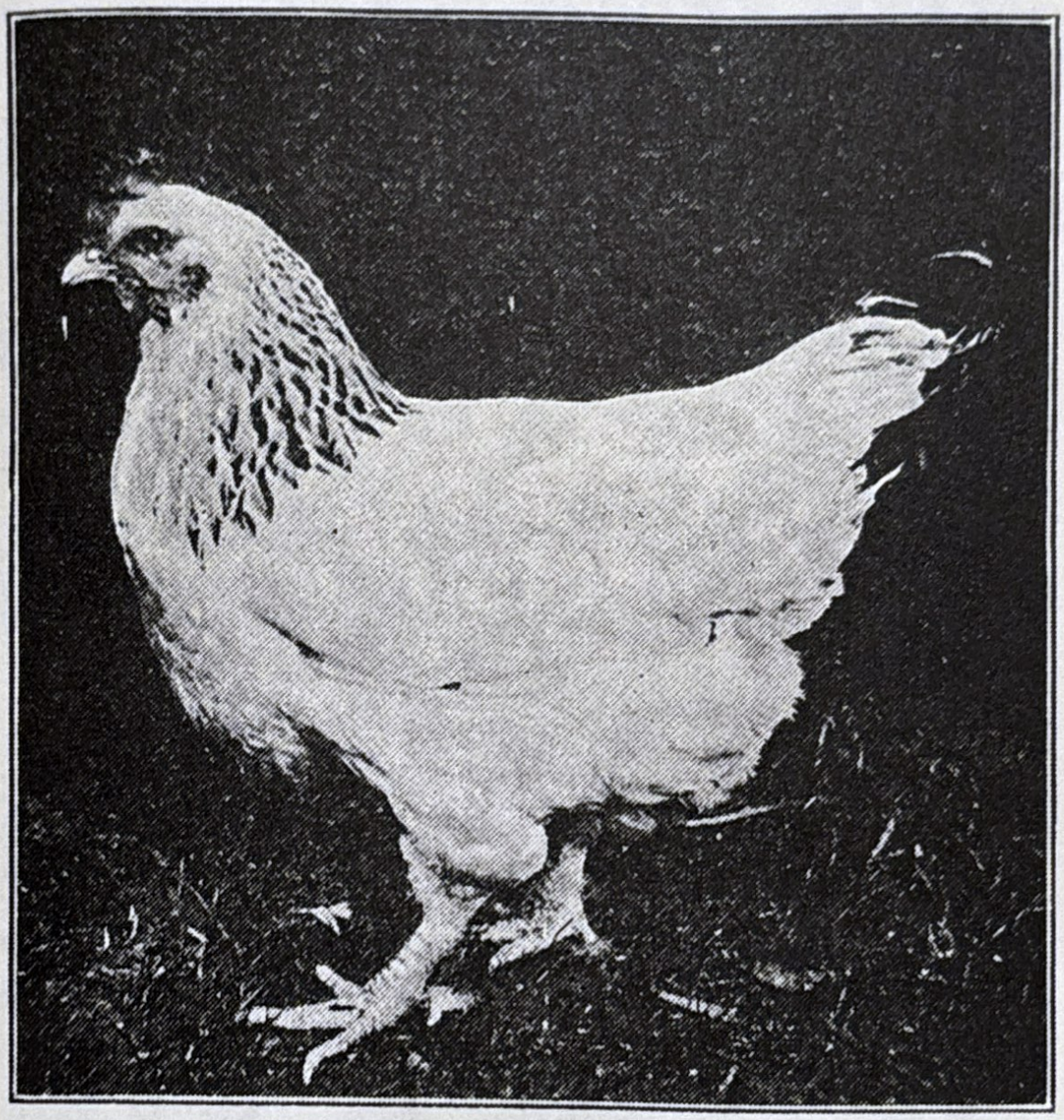
culture,* the former are preferred. It is just a "matter of taste," and can no more be explained than the fact that, if given the choice, nine people out of every ten will choose a

PRIZE-WINNING PAIR OF INDIAN GAME-DORKING PULLETS.

brown egg before a white one. The producer, however, cannot dictate to his patrons, the consumers; he must supply that which is demanded of him.

* The poultry industry of the U.S. of America is, according to official facts, that country's most valuable asset, yearly amounting to over £56,300,000 sterling—greater than the value of the corn or cotton crop!

Surrey and Sussex Fowls.—Some of my readers will remember a race of fowls that was almost entirely confined to the counties of Surrey and Sussex, and which, as table fowl, were as near perfection as it is possible to be. From the days of the Romans those counties have been



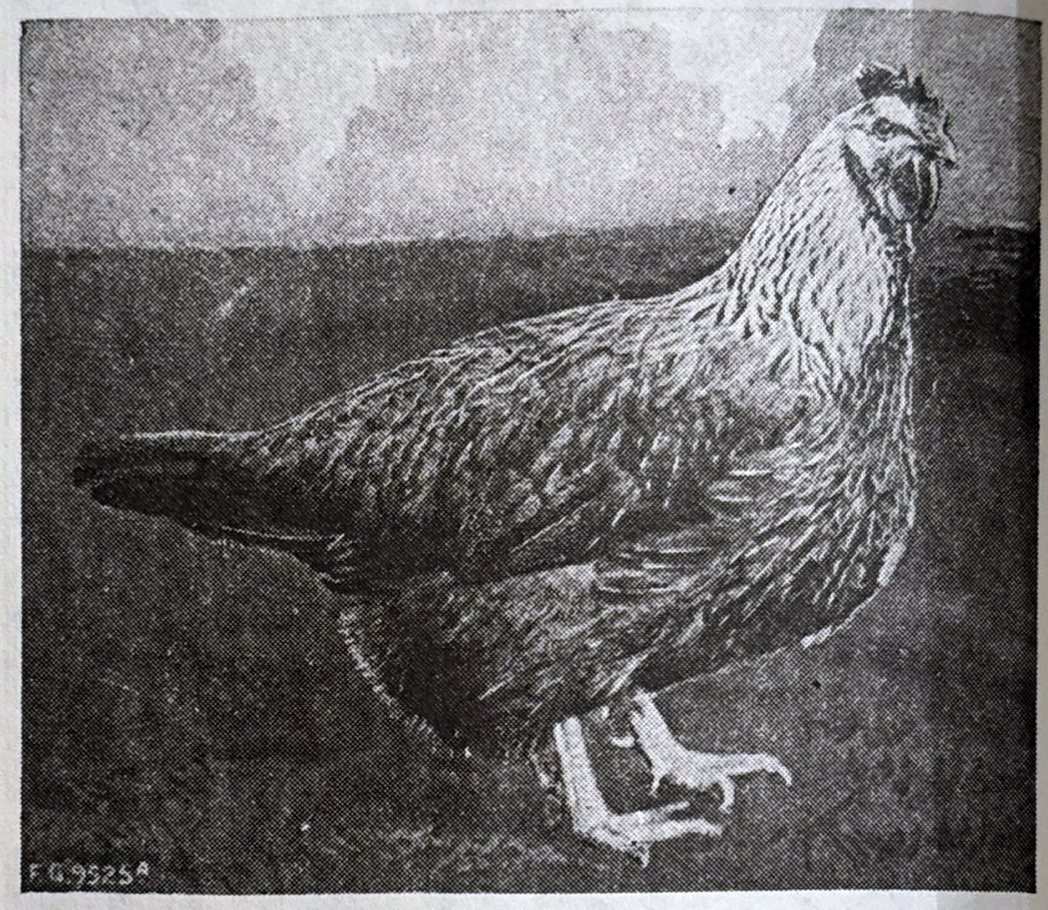
A Typical Light Sussex Pullet.

Winner of a first prize at the Royal Show, Derby, 1906. Exhibitor and Breeder: J. Hepburn, Esq., Laughton, Sussex.

noted for their poultry-fattening industry, and for centuries the old Surrey fowl had been selected and bred for that one purpose. It was a kind of barn-door, with white legs, a broad, square frame, and in colour brown, bay, or speckled with black or white. It contained a strong in-

fusion of Dorking blood, and therefore had much of the character of that fowl.

In the first edition of this Handbook it was stated that the original "Surrey" fowl had practically become extinct. Since this expression of opinion was published, the Sussex Poultry Club has been inaugurated with a view to framing a standard



Silver Grey Dorking Hen.

for breeding the Surrey and Sussex fowl too. This is a step in the right direction, and will facilitate the resuscitation and improvement of the breed on up-to-date lines. Whether the Sussex Poultry Club will achieve the main object that should be kept in view, namely, produce a strain possessing the highest table properties, without sacrificing these attributes to uniformity of colour, remains to be seen. The standard laid down is as follows:—

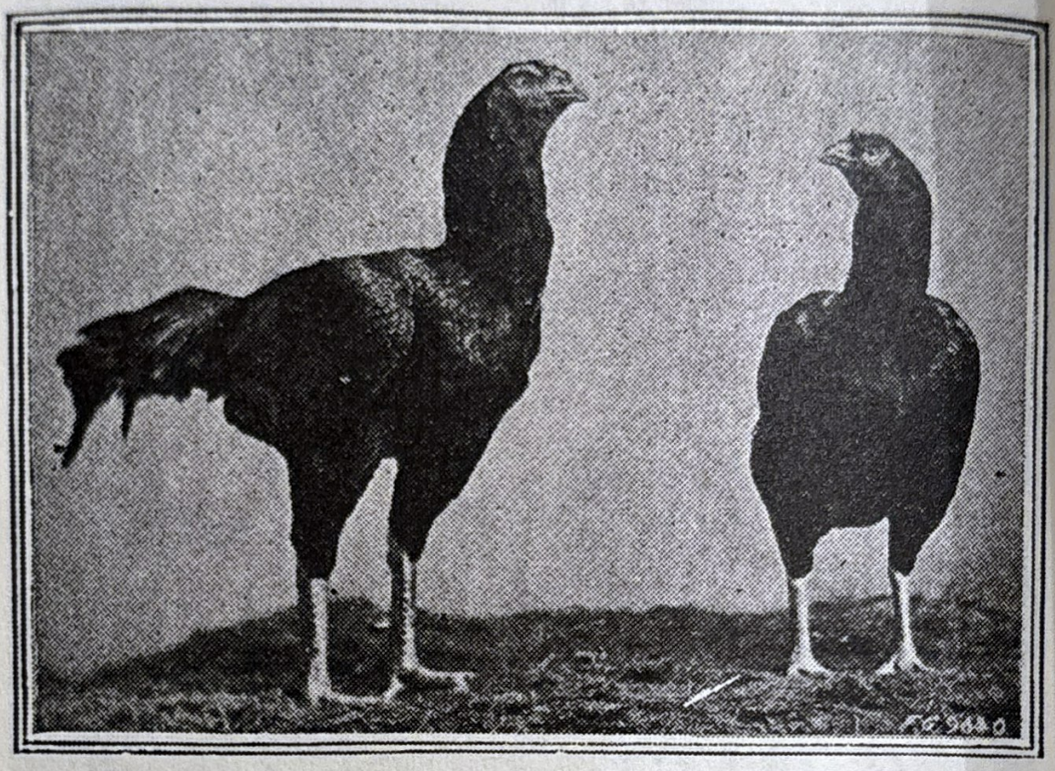
Cock.—Head and neck: head, size medium; beak, short and strong (curved); eye, full and bright; comb, single, medium size, evenly serrated and erect, and fitting closely to

PRIZE SILVER GREY DORKING COCK.

the head; face, red; earlobes and wattles, of medium size; neck, gracefully curved, with fairly full hackle. Body: breast, broad and square, carried well forward, with long and deep breast bone; shoulders, wide; back, broad and flat; skin, clear

and fine in texture; tail, moderate size; wings, carried close to body; thighs, short and stout; shanks, short and strong and rather wide apart; toes, four in number, and well spread. Weight: 9 lbs. and upwards.

Hen.—Head and neck as in cock. Body, ditto. Tail: small, curved backward; other characteristics as in cock.

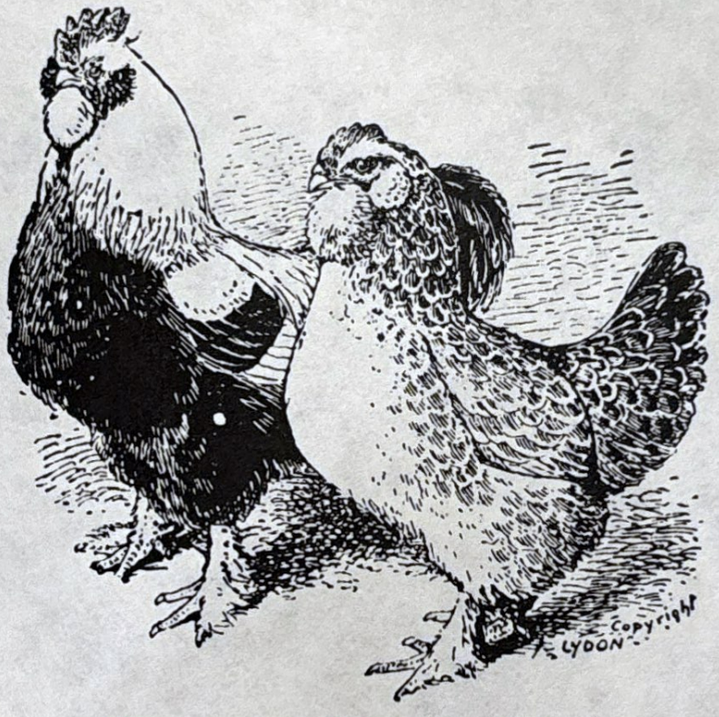


A Pair of Indian Game Fowls.

Weight: Adults from 7 lbs. upwards. Plumage, in both cock and hen, close.

Dorkings.—All fattened fowls coming from Surrey and Sussex now-a-days are called after the names of those counties, and consist of a variety of breeds and cross-breeds. They fetch the highest prices in the London markets on account of their superior quality, which is not only the result of better methods of fattening, but the fatteners themselves are backed, in a trade demanding great skill, by the experience of generations of others before them. As a pure

breed the Dorking is the table fowl par excellence; it grows to a large size, has white legs, a clear white skin and flesh, a long keel, fine bone, yet plenty of frame. The illustration of a Silver-grey hen gives an excellent idea as to the general outline of the bird. The squareness of the body, full breast, and long, deep keel are well displayed. Another illustration shows a cock of the same variety. Many strains of Dorkings are unfortunately delicate, and do not grow fast enough for

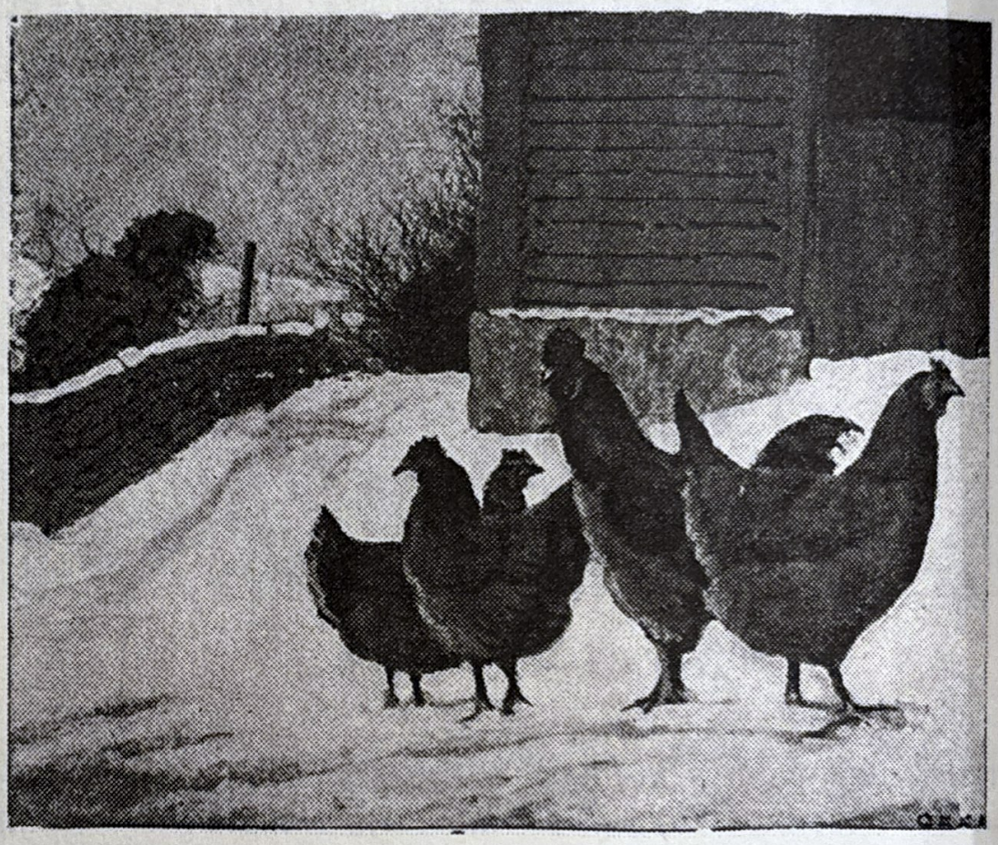


FAVEROLLES COCK AND HEN.

present day poultry keepers. The result is that crossing has been resorted to, and a Brahma cock mated to Dorking hens produces a fowl in great favour with fatteners. The Houdan-Dorking is scarcely so large as the foregoing, yet it is a good table fowl, rapid grower, and hardy. The Indian Game, or Old English Game-Dorking is also a fine fowl, and for many purposes is hard to equal. The youngsters put on flesh rapidly and nearly always carry a good breast, whether being fattened or not. Cage-fatteners, or crammers, however, prefer a chicken with a larger frame for their purpose and, on

that account, the Faverolles, a combination of Dorking, Houdan and Brahma, has become immensely popular. This breed, for it may now be considered as such, has a great future before it. It is looked upon with distinct favour, not only by the fatteners, but the poulterers and consumers, and it even threatens to dislodge the Houdan itself from its own district of that name, where the latter has so long reigned supreme as the table fowl of France.

The Buff Orpington deservedly claims to be a



HARDY WINTER LAYERS (BUFF ORPINGTONS).

table fowl of the first quality, and, unlike the Dorking or Game, possesses the character of being a good layer. Hence we have in this breed all the attributes that go to make an all-round fowl. Buff Orpington cockerels are, as a rule, backward in feathering and, unless fattened artificially, are slow

in making breast meat. This can, however, be remedied by crossing with a Houdan cock, the result being an excellent fowl.

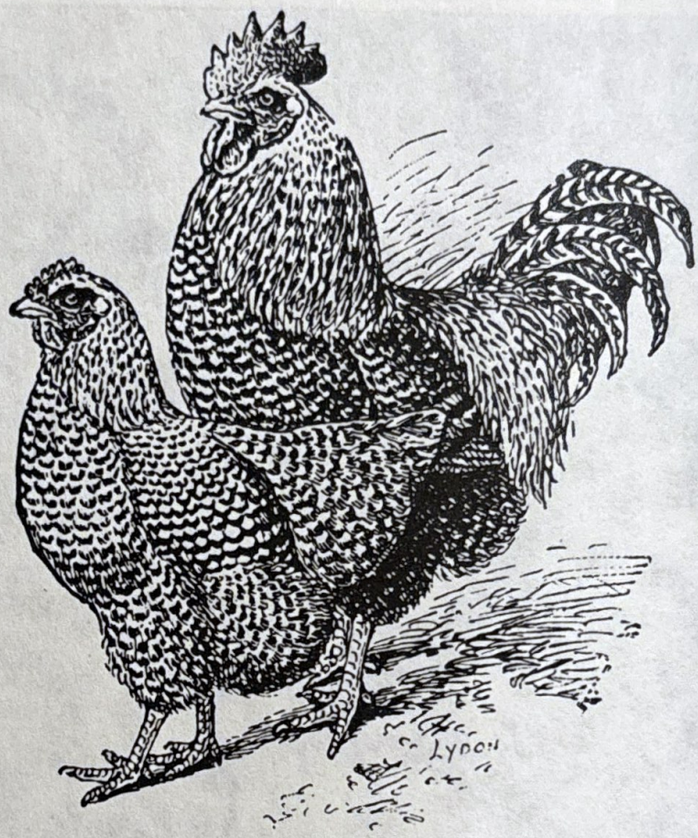
Game Fowls call for special mention, and of all the varieties, nothing can equal a white-legged Old English.

[Photo: A. Rice.

OLD ENGLISH GAME COCKEREL.

In the pure state all Game fowls are small, with the exception of the Indian, which is scarcely a true Game, yet the amount of meat in proportion to bone and offal on a Game fowl of any description is greater than that found on any other breed. Dorkings, Orpingtons, Wyandottes, may be crossed

with Game cocks for table purposes, and it will be found that the chickens will plump more readily on the breast and be marketable at an earlier age. The flesh of Game fowls is exceedingly fine in grain and flavour, and the breast slices are deep like those upon a pheasant.

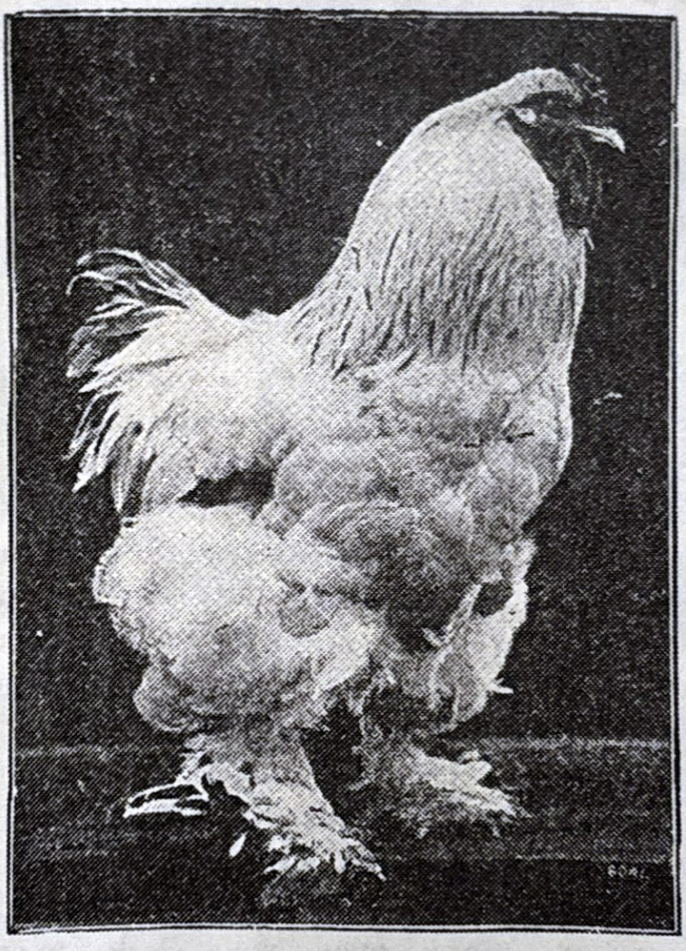


PLYMOUTH ROCK COCK AND HEN.

The Plymouth Rock is one of the most popular table fowls among small poultry keepers and cottagers. Many of the consignments of live chickens, which are sent to London from Ireland and Wales, are Barred Plymouth Rocks. The breed is extremely hardy, the chickens grow at an amazing rate, fatten easily, and, apart from their yellow skin, possess all the points of good table birds. If the Rock be crossed with a Houdan, most of the chickens will come with white skin and legs, and will be hard to beat by any other cross.

The Houdan.—I have already mentioned the Houdan for crossing purposes. It is one of the most useful fowls we have, and any beginner in doubt will not be making a mistake in taking up Houdans.

The Brahma possesses the main characteristics of a



Light Brahma Cock.

good table fowl—size. Cocks of this breed have been known to weigh as much as 15 lbs. to 16 lbs. A cross between the Brahma and the Dorking, already referred to, is exceedingly popular, and for size can be scarcely equalled. In the pure state the Brahma is somewhat "scraggy" and lanky, but in combination with some other breeds is all that can be desired,

and there are probably as many Brahma crosses used in table poultry now as those of any other.

Choosing the Breeds or Crosses.—No one of the above breeds or crosses could be singled out as the best for all circumstances. The beginner will have to make his choice according to the requirements of his market. If he disposes of his chickens in a "lean" condition to the fatteners, or, if he fattens himself, the pure Faverolles, Brahma-Dorking, or Houdan-Rock, will serve his purpose. If the chickens are to be fed at liberty, as is the case on the majority of farms and cottages, Game, Houdan, and Rock crosses may be used. Nothing so improves the quality of flesh as Game blood, and those who cater for a "select" private trade may use a Game-Faverolles cross with excellent results. It must be borne in mind, however, that selection must always be exercised as in the case of breeding for laying. Crooked breasts must not be countenanced in the breeding pen. A long, straight keel, fine skin and flesh, light bones, health and vigour, should be the main characteristics of our breeders; and size, consistent with good quality, is the most important point to be remembered. As I have stated above, even the "spring" chickens now have to be large if they are to hold their own with the foreigners from the "cold storage" depots. If poultry fattening is to be the only undertaking, it will generally be found more convenient to purchase the chickens already reared from "higglers," who collect them from the farms and cottages of remote rural districts, or contracts may be arranged with country dealers to supply a given number every week. Beginners who commence with the idea that they can rear sufficient numbers at home to keep the fattening cages always filled will sooner or later suffer disappointment. It will be almost impossible for him to keep up an even and regular supply, week by week, the year throughout. He must prepare himself to depend on others at certain seasons, at any rate, for his supplies must never run short. So important is this matter of keeping up a supply of lean chickens for fattening, that there are many people, both in this country and Ireland, who make it their

business to rear the birds up to about the age of ten weeks, and dispose of them alive to "higglers," or to the fatteners direct. The prices realised are good, and tend to increase year by year. During the months of March, April, May, and

Miss Edna May Feeding Fowls.

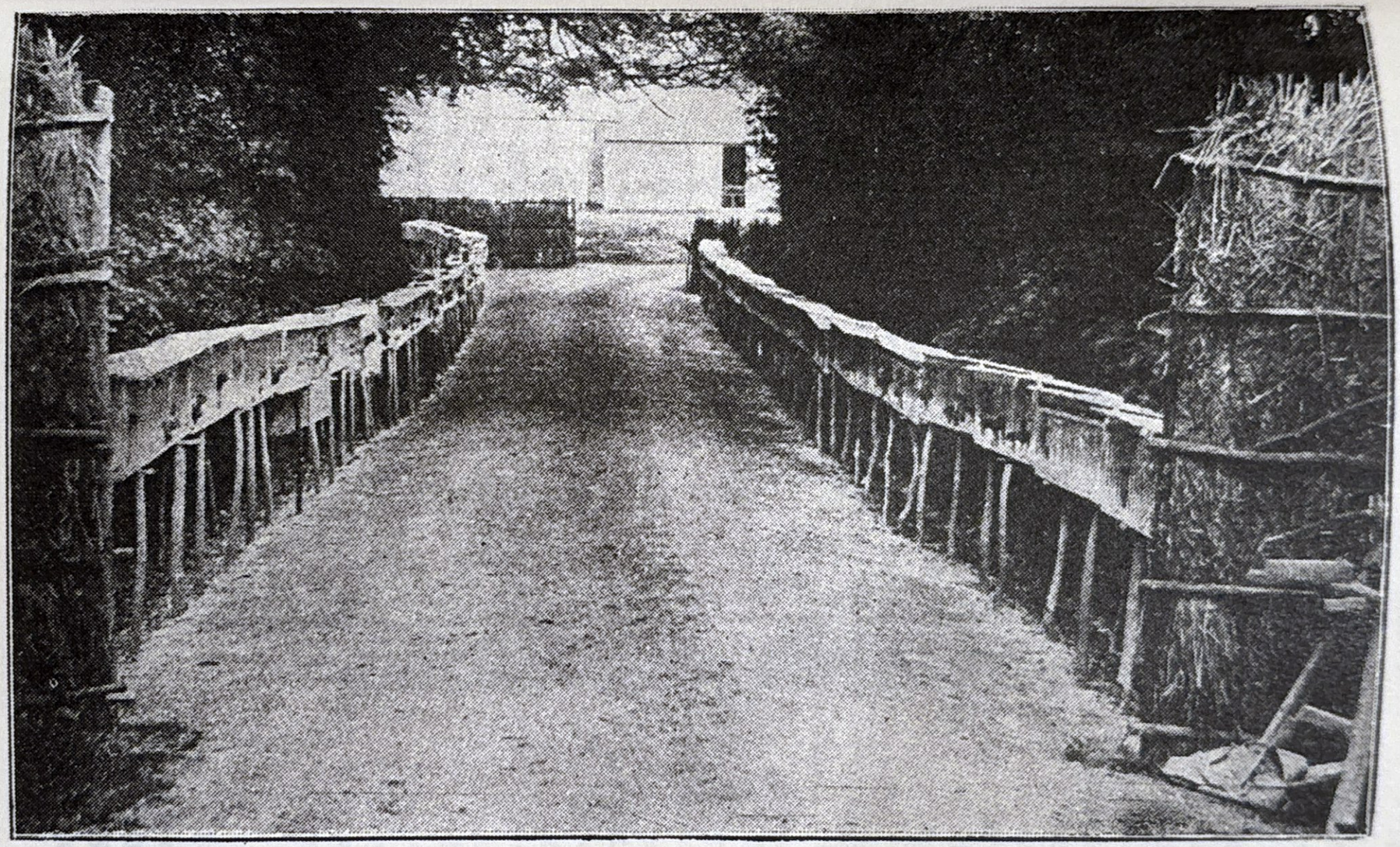
June, prices range from 2s. to 3s. each, according to size and quality, which is remunerative enough for stock that has been scantily fed for a few weeks. It is during those four months mentioned above that it pays the fattener to produce his own chickens better than at any other time. During the

remainder of the season he can procure as many as he requires at a very much lower figure, and his balance sheet will be more satisfactory than if he had reared all, or nearly all, at home.

CHAPTER IX.

FATTENING OF TABLE POULTRY.

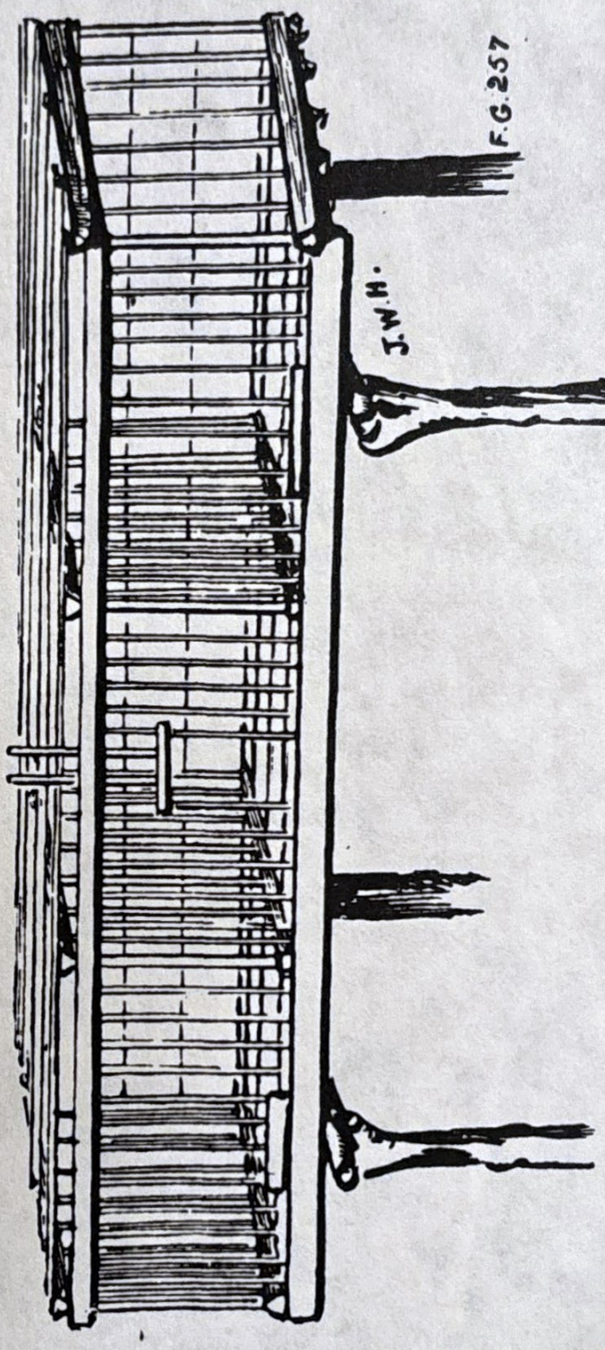
FEEDING poultry correctly, as we have seen when speaking of laying hens, is no easy matter to be picked up in a few lessons, but fattening, when birds are penned up and treated artificially is far more difficult. It is a business that calls for special qualifications, and the successful fattener is "born, not made." There are beginners whom I have seen, hard-working, industrious lads, who, after toiling with all their "heart and soul" for years, could never turn out a well-fatted fowl. The successful fatter is possessed of a kind of instinct which tells him exactly how much every individual bird can take from the cramming machine, that teaches him when a bird is "finished,"or when it is slightly ill. He knows exactly how much food to place in the troughs so that it will be all cleared up without the birds sickening their appetites, and mixing the food itself is an art. He must also know how to buy and how to sell, and to detect good or bad quality at a glance. He must be a good business man, for his profits are derived from numerous small amounts, and the margin on each fowl after paying expenses is a narrow one. The Surrey and Sussex fatteners who turn out the best fowls depend entirely upon their skill in fattening. They are using the same breeds or cross-breeds as others, but that instinct, inherited from generations of ancestors, is the power which



SUSSEX CHICKEN-FATTENING ESTABLISHMENT.

enables them to turn an Irish or Welsh fowl into a "Surrey," or "Sussex" in a few days' time.

Fattening Cages.—There are a variety of methods



A Sussex Chicken-Fattening Cage.

employed in fattening poultry. The most usual, and perhaps, for most circumstances, the most easily adapted, is trough feeding from cages. These cages, or pens, are usually arranged in

single rows as shown in the illustration given herewith, and made to hold any number of chickens—three to six being usually penned together. A pen, 3 feet long and about 18 inches wide, and the same in height, will accommodate six fowls of good size. The pens are constructed entirely of open wood-work, often rough and unpeeled, the rods being placed about 1½ inches apart, and lengthwise at the bottom, and upright and rather wider apart in front, so that the chickens can get their heads out to feed. The bars upon which the birds stand are round, so that the dung will fall through on to the ground below. Some dry earth may be sprinkled underneath to deodorise the manure, but lime should not be used if the manure is to be employed for fertilising purposes. The cages themselves should be regularly lime-washed, and everything kept as sweet as possible. During warm weather they are best in the open air, under the shade of trees, or sheltered with a temporary roofing; but in winter time the birds must not be exposed to the cold more than possible. A tolerably high temperature is conducive to good fattening, while the chickens that have to utilise a large proportion of their food to maintain their bodily warmth will seldom, if ever, fatten satisfactorily. Everything that conduces to quietness and contentedness must be employed. The cages should be placed facing a hedge or wall, allowing just enough room for the attendant to walk along the front, so that the occupants may not be attracted by the outside world. Failing such a screen, a piece of thin sacking may be hung in front of each cage. The fattener, as he goes his round feeding, must be on the alert for bullies or feather-eaters, which disturb the other birds in the same and adjoining cages. Too much stress cannot be put upon the importance of keeping the fowls quiet and peaceful.

Food for Fattening.—The chickens are placed in the pens at about the age of ten weeks. They are made to fast for the first twelve or fifteen hours, so that when food is put before them they start with a good appetite. Troughs made V-shaped are suspended along the front of the cage, into

which the food is placed. The latter usually consists of ground oats, which has been found by long experience to be the very best meal it is possible to use for the purpose. It generally contains a small percentage of barley meal, but the whole is ground so fine that it appears white, floury, and free from husk. This is mixed into the consistency of porridge, with sour milk. It may seem strange to some people that sour milk should be preferred to sweet, but the fatters have a very good reason for this preference. The fact is, that if sweet milk were used, vegetable food would have to be supplied to keep the body in a healthy condition. But sour milk has been found to have the desired effect in preserving the digestion and keeping the bowels in a normal state, so that the labour and expense of giving vegetable food is dispensed with, and the chickens thrive and become whiter and finer in the flesh from the use of the milk. When sour milk is not employed, butter-milk, or boiled nettles, the latter, finely minced, and mixed into the food will be beneficial in maintaining health. It would not be saying too much to state that the great poultry fattening industry of South-Eastern England practically owes its existence to sour milk.

Number of Meals per Day.—The chickens are fed twice daily, at about 6 a.m. and 7 p.m. in summer. They are given as much as they can eat without leaving any. As they show signs of having had enough, the trough must be taken away and the curtain of sacking hung over the front of the cage. The food being sloppy, the birds cannot pick much up at once, with the result that they pick much faster, and eat against one another as if in keen competition as to which can eat fastest and the most. This is the kind of appetite that must be maintained; if it slackens something is wrong. The food must be given at regular hours, and the birds should be eagerly looking out for the attendant, and ought not to be kept waiting longer than necessary. A great many chickens are fed in the troughs in this way for about three weeks, and killed in what an experienced fatter would call a "half-fat" condition. These birds, however, are far better

in weight and quality than those fed running about our roadsides and farmyards. The fact of the birds being penned up and debarred from taking exercise enables them to turn into flesh and fat that food which they would otherwise expend in bodily activity. The farmer acknowledges that in the case of his cattle, who are fattened in strict confinement, but he is slow to comprehend that the same rule applies to poultry. If a little rough fat or suet is mixed with the food daily, during the last nine days of confinement, the results will be more satisfactory.

The Pellet System of Feeding.—The best fowls, however, are, after being trough fed as described above for about a fortnight, crammed either by hand or machine. In the case of the former, the food is mixed sufficiently stiff to be rolled into pellets about 1½ inch long. The fatter prepares a number of these, takes the bird from its cage, and places it between his knees. He takes the head in the left hand, and places the fore-finger between the upper and lower mandibles. With the right hand he takes a pellet, dips it in a bowl of milk, or fatty meat liquor, and slips it down the throat, working it into the crop with the finger and thumb from the outside. Each bird is given seven or eight pellets, enough to fill the crop, twice a day. This method, although somewhat tedious, is often employed in producing the very finest and largest fowls, but the bulk of chickens are treated with

The Cramming Machine.—The illustration gives a good idea as to what one of these machines is like. The food, similar to that used in trough feeding, is placed into the machine, and the latter is wheeled along the front of the cages. Each bird is taken out, a tube inserted down its throat, and the attendant, by means of a pedal forces the food into the crop until the latter is full. The operation can be done very quickly, an experienced hand being able to cram 200 to 300 birds an hour, but it is one that demands an extraordinary amount of practice. The fatter must not only learn to work quickly, without injury or causing unnecessary

pain to the bird, but he must be able to tell to a nicety exactly how much the different individuals can take. If too much is given, the bird will probably die. If a fowl is not

Sussex Cramming Machine.

improving but sickening off, it should be at once detected and disposed of, or put into an open run for a few days. A fatter must be a skilled hand before he can realise success. Many a

beginner takes up the business which sounds so simple on paper, but he soon finds to his cost that there are things to be learned and engrafted on the mind that can never be picked up from written directions. We know of no more difficult work, no occupation in the wide field of poultry culture that demands such a long and careful apprenticeship as fattening. If fattening is not made the main business, surplus cockerels should always be penned up for a few weeks before being disposed of to the consumer. When they are sold to the "higgler," whose business it is to sell to the fattening establishments, no fattening, of course, is necessary, but when he is merely a go-between, trading between producer and retailer, then proper feeding will pay. In many parts of the country one would not derive any benefit from fattening, simply because the public do not appreciate a fatted fowl as they should. But the demand is steadily increasing and spreading, and even now fattening establishments are being fitted up for the supply of our provincial markets.

Advice to Beginners.—The beginner will have to judge for himself whether it will pay him to fatten or not, by the class of fowls which his particular market demands. The time will come, however, when the lean and scraggy specimens of fowls, which visitors to sea-side and country towns are content to pay for, will be things of long ago. It should be the duty of every poultry keeper to endeavour, if only in a small way, to push the superior merits and economy of the fatted fowl.

CHAPTER X.

KILLING, TRUSSING, AND MARKETING.

In a few country districts birds are sent alive to the market, but the practice is dying out, and now the majority are killed, plucked, and shaped at the fattening place. In some provincial towns fowls are sent out with merely the soft feathers removed, but these are exceptions. Birds properly prepared for the salesman not only fetch better prices, but are more satisfactory to all concerned. An ill-fatted bird, if well plucked and shaped, may produce more than a better specimen that has been handled badly. The producer must bear in mind that when his consignment reaches the market, it will come into competition with hundreds of others. He must prepare and pack so that the fowls will look clean and firm, and not flabby as if mauled by dirty hands. They must be graded into different sizes and qualities, and be free from ugly blemishes. such as tears or bruises.

Starving Before Killing.—Before being killed the birds must be starved. It is almost useless to withhold food for about fifteen to eighteen hours as is often the case. Twenty-four to thirty-six hours should be allowed for the process, a longer period being required in warm weather. If a bird be not sufficiently starved before killing, it will not only commence to decompose very much sooner, affecting the taste and appearance, but, while packed with others, it may foul a whole consignment. The old notion that while a bird is being starved for thirty-six or forty hours it is losing weight and flesh is altogether unfounded. During that short period the fowl falls back upon its reserves, comprising for the most part

the fatty portions amongst the intestines, and the actual loss in weight is practically nil.

PROPER WAY TO KILL A FOWL.

Killing.—The best way to kill a fowl is by dislocating the neck. Take the bird in the left hand by the legs, after tying the latter, and grasp the head with the right. Some people

get the head between the first and second finger, others, in a more natural manner, put the thumb under the head, the fingers meeting it over the top of the skull. The main point is to avoid grasping the skin of the neck itself, for if that is done a breakage will occur, which will allow the blood to leak. Having grasped the head, let the left hand, holding the feet, rest on the left thigh for support, and a steady downward and outward stretch will dislocate the vertebral column where it connects with the skull. As soon as that happens, any feeling or sensation must be impossible. The fowl's muscles are convulsed for a few moments, and while that is occurring, and the blood draining into the head, the bird should be hung by the legs. Half-a-dozen or more may be killed in this way and suspended. Plucking should then be commenced on the first one, so that all are finished before they become cold.

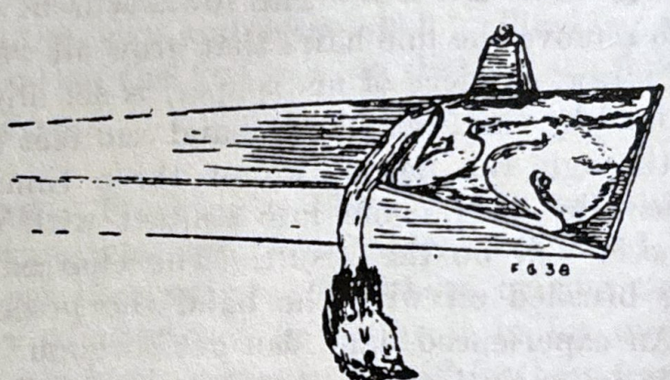
Plucking.—Plucking is like milking inasmuch as it demands much practice before proficiency is gained. The main thing is to get the feathers off without tearing the skin, and almost every plucker will go about it in his own way. As a rule it is desirable to remove the stiff feathers from the wings and tail first, afterwards commencing at the neck and plucking all that remains with the exception of the stubs. The parts which are most easily torn, are the feather tracts on either-side of the breast. The beginner must be content to remove one or two feathers at a time only until he gains experience, and if he holds the skin firm with the finger and thumb of the left hand, while he draws the feathers somewhat sharply with the right, the risk of tearing will not be so great. A fowl that shows a number of tears or pits realises so much less in the market, and one that is plucked clean will fetch a better price than the one upon which there is still some more work left to do. The soft feathers must be placed apart from the stiff ones as the plucking is progressing, and afterwards hung up in sacks or coarse canvas bags in a dry, airy place. After plucking, the fowls will have to be stubbed; that is, the immature feathers must be removed. These are usually too

small to be grasped, so a blunt knife is employed. The blade is passed under the stubb (while the fowl's head is towards the operator), and the latter is drawn out while holding it on the blade with the thumb. When possible, it is better to avoid killing birds that are covered with these immature feathers. They take longer to remove than the others, and in the case of a black or dark-coloured fowl, the colouring matter with which these young feathers are filled often stains the skin, or becomes visible through the latter before the shaft appears on the surface. This is a further argument in favour of light-coloured birds for table purposes.

Singeing the Birds.—The fowls will now require to be singed to remove the fine hairs that grow all over the body. A bunch of straw, or piece of newspaper, is set alight, and the bird being held by the head in one hand and feet in the other, is passed through the flame two or three times. On no account must the body come into contact with smoke, or a blackened skin will be the result. The charred remains of hairs being brushed off with the hand the process is so far finished. An experienced hand can get through it in far less time than it takes to describe it, ten to twelve fowls an hour being about the average rate. It should be almost unnecessary to add that the feet, beak, and vent must be cleaned, if showing any trace of dirt.

Shaping is the next operation, the object being not only to force all the available meat up to the breast, where the best slices are expected, but to make the fowl look more presentable and pleasing to the eye—an important point. There are various methods of shaping or pressing in vogue, one of the better known being as follows:—A trough is made V-shaped, but usually with one side more vertical than the other. While the bird is still warm, the wings are twisted over on to the back, the legs pressed down so as to rest on either side of the breast, and the fowl is then placed in the trough in the position shown in the illustration. The trough must be filled with fowls, placed close together, and a board

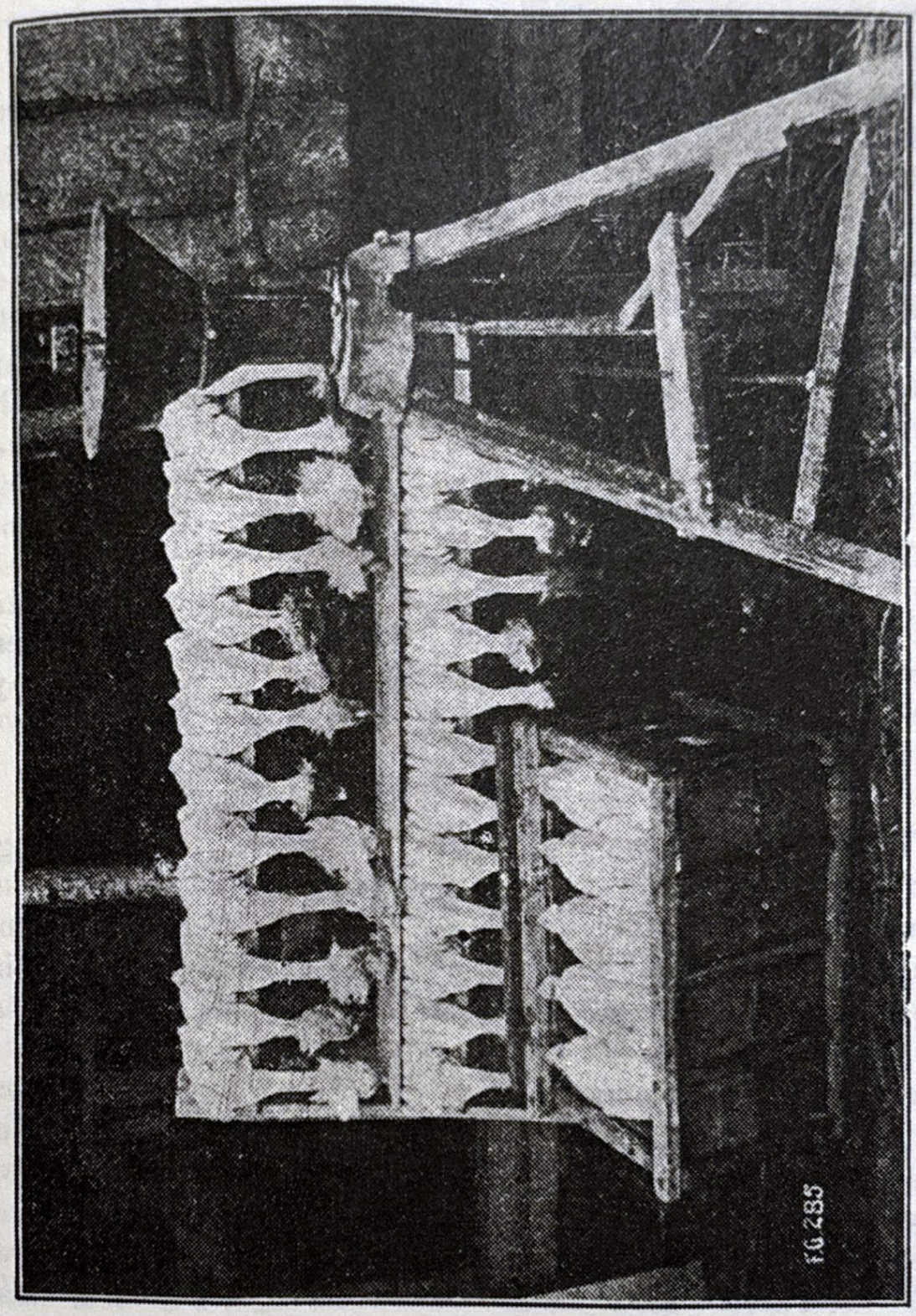
four or five inches wide is laid on their backs. This is weighted with a 56-lb. weight or heavy stones, and the fowls are left in that position for six or seven hours to cool. The troughs must be placed in the coolest available place, and if in a direct draught so much the better. If the process be properly carried out the fowls come out of the press absolutely transformed in appearance, and no fatted fowl should be marketed before being treated to one or other of the systems employed. A fowl with a broken breast bone should not be countenanced by either the salesmen or consumers. The practice can never make a poor fowl any better than what it is, and it is merely a deception and nothing more.



SHAPING POULTRY FOR MARKET.

Grading.—The fowls must be arranged to some extent according to size when being placed in the trough, but before packing they must be subjected to another grading. We have seen how very important this is in the matter of eggs, and intelligent fruit and vegetable growers know that the foreign articles that he has to compete with in the market are often preferred to our own produce simply because the consignments are carefully graded and ours are not. Fowls must be sorted according to size and quality. If good and bad are all jumbled together into one case, it will only fetch the price of the bad. It is a rotten policy to place a few good specimens on the top of the case, so as to attract the eye of the salesman, while those underneath are inferior. Once that is done your consignments will be henceforth re-

garded with suspicion. The foreigner has discovered long ago that, not only in the matter of poultry and eggs, but with



PRESSING CHICKENS FOR MARKET.

vegetables and fruit, that honesty pays best in the long run. Now that we are "suffering" from foreign competition, it is

poor consolation to be reminded of the fact that we are reaping what we have sown; our home consignments are still looked upon with an eye of distrust and suspicion by the market.

Packing.—It does not much matter how the fowls are packed, so long as certain rules are observed. The crate, basket, or box, should be deep enough to take two layers of fowls, with some space for packing to spare. Some clean wheat straw or wood wool is first laid at the bottom of the crate, and the fowls placed breast downwards upon it. A little straw may be put between each fowl and all made tight and firm. The bottom layer being finished it is covered with a couple of inches of straw, and the other layer placed on the top as before. All corners and crevices must be filled up, and the whole packed so tightly up to the lid that the contents of the package cannot shake about and become bruised and scratched. The main point is to so pack that the fowls will arrive at their destination, firm and clean. The sender should have his name on the label so that the salesman may know whose crate he is handling, and the latter should always be advised by post of the dispatch of the consignment.

Trussing.—The fattener seldom undertakes any trussing, that part of the work being confined to the retailer, or to the poultry farmer or cottager, who deals direct with the consumer. Of late years there has been a marked increase in what is called the private trade, and farmers and others living in remote rural districts are making substantial additions to their incomes by selling their poultry direct to the consumer, either locally or through the Parcel Post. Thus they do not only get better prices than what the "higgler" would give them, but for the little additional trouble of trussing neatly and well they can command the poulterer's retail value. It is true that the Parcel Post rates are somewhat high, but then, many private customers are willing to pay a little extra for first quality supplies, direct from the country, that are delivered to their doors. Most of the railway companies, too, have

extremely low rates for agricultural produce, as much as 50 lbs. being carried 30 miles for sevenpence, and the greater the weight the less the proportionate charge per mile. Supposing the fowl to have been fattened, killed, plucked, singed, and

A Pair of Buff Orpingtons. Weight 11¼ lbs.

shaped, the first thing to do before trussing is to draw it as follows:—Lay the fowl on its breast with its feet towards the operator. At the back of the neck cut the skin with the knife or scissors, for about three inches in a longitudinal direction. Seize the neck through the slit, draw it out, and cut it

off close to the shoulders. Cut off the head so as to leave about 2½ to 3 inches of skin still attached to the shoulders. Now turn the fowl on its back with its feet towards the operator's left side. Take the skin that covers the shoulders in the left hand and, raising it, peel away the crop that will be seen adhering to its inner surface. Draw out the wind-pipe, and after inserting the finger and working it round the lower part of the crop so as to loosen it, cut off the latter and fold the skin of the neck over the orifice and stump of the neck. Turn the fowl round and, with the scissors, cut across between the "parson's nose" and the vent, care being taken not to pierce the intestines. Work the scissors round the vent so as to entirely detach it from the skin without cutting the bowel. Insert the two fingers into the orifice and, grasping the gizzard, draw gently and the whole of the viscera will come out intact. Separate the liver, and cut off the gall-bladder, without bursting the latter, and detach the gizzard from the intestines. The "merry-thought" may be removed by raising the flap of skin on the breast and placing the blade of a knife under the bone and gently wrenching the latter from its place. Cut the skin of the shank lightly mid-way between the hock and the foot and, with a sharp bend, snap the bone. The sinews can then be drawn out of the "drumsticks." A little trimming with the scissors may be required on the wings and the bird is ready to be trussed.

The Most Up-to-date Method of Trussing is with a needle and twine, but as the beginner would never be able to grasp it from written directions, the following method of using a skewer had better be practised until a practical demonstration can be attended, when the former plan may be quickly grasped. The points of the wings being twisted over the back, the fowl is placed breast upwards and feet towards the operator. The legs are now forced forwards and downwards until they touch the table. Now the skewer is inserted above the first joint of the wing, pressed through the leg, as shown in the illustration (Fig. 1), over the back, securing the flap, and similarly holding the leg and wing of the other

side in position. The back of the fowl will now appear as in Fig. 2. The gizzard must be emptied of its contents and, together with the liver and neck, be placed inside the fowl, or wrapped in white paper. Sometimes the gizzard is passed through one wing while the liver adorns the other, but, now-a-days, they are oftener sold apart for the stock-pot. The orifice at the stern of the fowl may be closed by passing the hole from which the vent was cut over the "parson's nose." Tie the legs down to the latter, and the fowl is ready. In trussing for boiling the same method may be employed, but

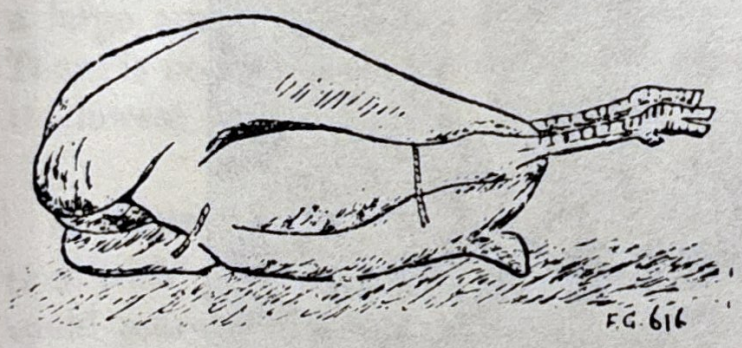


FIG. 1.
FOWL TRUSSED WITH TWINE.

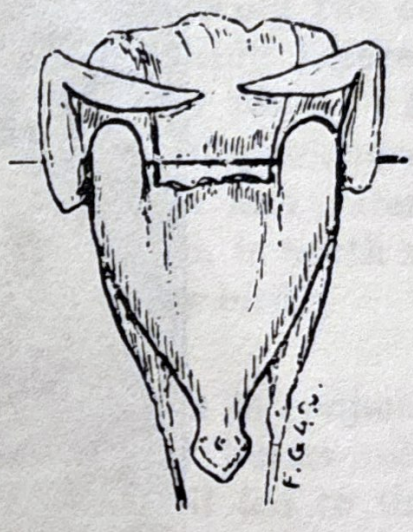
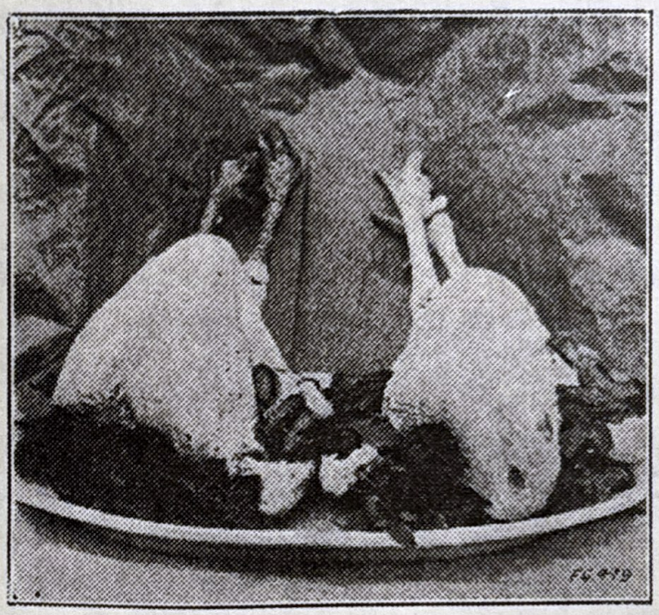


FIG. 2.
TRUSSED WITH SKEWERS.

it is usual to remove the shanks at the hocks. A fowl that is drawn neatly should not be washed, as the water will cause the flesh to commence to decompose the sooner. A wipe with a damp cloth should be sufficient. The breast bone, as I have already mentioned, should not be broken, and the sprinkling from the flour dredger, although it may "cover a multitude of sins," is a bad practice. It makes a fowl look nicer for a time, but if the flour gets damp it soon sours and becomes objectionable

Packing for Market.—A couple or more fowls are best packed for sending to private customers in a bass. They

only require wrapping in clean white paper, the bass being sewn tightly to prevent the contents from shaking about and rubbing one another. If fowls are sent with eggs or garden stuff, hampers should be used or some of the patent boxes now on the market. The secret of success in the private trade is to have everything of the very best quality, clean and neatly packed. Never disappoint your customers, always be punctual and reliable.



POULTRY READY FOR THE COOK.

The Best Markets.—A market can be readily worked up with private houses and hotels in our provincial and sea-side towns; and it is far better that a beginner should make a start in the provinces than tackle the London market. If he sells direct to the consumer, he will be wise who combines his fattening and egg-production with some gardening work or dairying. Fattening cages take up scarcely any room in a garden, or under the trees of a fruit plantation.

Poultry Manure is of inestimable value as a fertiliser. For tomato growing I doubt if it has an equal, while grapes and most garden vegetables thrive wonderfully on it. Spread

over poor grass land it will speedily improve it, and I have proved by actual experiment that a hay crop may be absolutely doubled, not only in weight but quality, by the judicious use of this manure. As a rule it is used too freely, particularly in gardens, with disastrous results; really, it is often more beneficially applied as a liquid manure. Lime liberates the ammonia and, thus robbing the manure, should not be used under the perches. Dry earth is a good deodoriser and may be mixed with the manure for fertilising purposes, in the proportion of two parts of the former to one of the latter. The dung should be collected from the poultry houses or from underneath the fattening cages, at least every two or three days, excepting when the houses are deeply littered and used as scratching-sheds, and stored in a dry place. If thrown on the farmyard midden along with the other manure, a large amount is wasted by the exposure to air and water. There is no doubt that fowl manure, properly used, is worth at the lowest estimate a shilling per annum for every bird.

A Few Suggestions.—If dairying be run in conjunction with poultry keeping, the spare milk and butter-milk could scarcely be put to a more profitable use if fed to the fatteners or chickens. Green stuff, turnips, mangolds, and potatoes are all useful and the first essential, and while the hens' food may be economised by the judicious use of the roots or tubers, these crops are being fed in their turn by the highly concentrated poultry manure. Thus we see how poultry keeping will "fit in" with almost all the other agricultural industries. I need scarcely repeat that it is not so much the object of this Handbook to encourage or promote poultry farming as a separate industry, but rather to stimulate a greater interest in poultry on the part of farmers, gardeners, and cottagers. The number of poultry now kept in these islands is very large, but it could be increased enormously to the advantage of the rural population and the country as a whole. Foreign importation need not be feared so long as our producers aim at the best quality. Just as the fancier forms in his mind an ideal, and in time produces it, so must

the utility poultry keeper breed and develop his stock into something better than what he at present possesses. Selection must be his watchword. The field open before him is a wide one, and bristling with difficulties, yet full of opportunities and encouragement. Before he enters it he must see that his equipment is good, or he will assuredly lose the day and suffer deserved defeat.

CHAPTER XI.

POULTRY AILMENTS.

DISEASES.

The poultry keeper has no greater enemy to resist, to fight against, than disease. It is his bête noir, ever at his elbow waiting an opportunity to seize upon and destroy his flock. The negligent breeder who feeds and houses his stock badly is usually the first victim, for he has avoided taking those necessary precautions which would have prevented disease from establishing itself. On the other hand, no matter how careful we may be in matters of hygiene, ailments often occur which must be promptly treated if we would prevent an epidemic. To be prepared to meet disease when it comes is to be more than half-way on the way to stamping it out.

Generally speaking, when a bird is found suffering from an infectious disease, it is wisest to kill it at once, burying it in quick-lime. If an attempt at curing is decided upon then the utmost precautions must be taken to isolate the sick bird. A warm, dry shed should be fitted up as a hospital Provide it with several cages in which to put single birds or

more, see that it is well ventilated, free from draughts, and that a "medicine chest" is within reach. The latter need not be an expensive article.

Although poultry are subject to an almost interminable list of ailments, with a few common drugs the attendant will be able to combat most of the everyday diseases. I would suggest that he fitted up his "chest" with the following: Some Epsom salts, a small bottle each of spirits of camphor, tincture of aconite, tincture of iodine, chlorodyne, terebene, and carbolic acid. An ounce or two of permanganate of potash and sulphate of iron, a chemist's mixture of iron and phosphate of lime, salad oil, turpentine, and an ointment, such as hazeline or vaseline; a few half-grain and grain opium pills.

Before going on to describe, as far as space will allow, the causes, symptoms, and treatment of the better known diseases, let me impress upon the poultry keeper, more particularly the beginner, the importance not only of the immediate isolation of sick fowls, but the equal necessity of at once finding out the cause of the complaint. Until the origin of the disease is discovered and rooted out it is hopeless to attempt curative measures. For convenience, the following ailments are taken in alphabetical order.

Anæmia.—Poverty of the blood. CAUSES.—Insufficient green stuff; overcrowding in dark, damp, ill-ventilated houses; lack of sunshine and fresh air. SYMPTOMS.—General depression, paleness of face and comb; extremities cold; emaciation; ruffled, lustreless plumage; pale, flabby flesh.

TREATMENT.—Remove the causes that have given rise to the ailment. Give nourishing food, fresh air, green vegetable and an iron tonic.

Bronchitis.—Inflammation of the bronchiæ, viz., the air passages leading to the lungs. CAUSES.—Draughts; sudden changes of the temperature. SYMPTOMS.—A "rattle" in the throat; heavy breathing; sometimes cough and running at the nostrils; expectoration.

TREATMENT.—Keep the bird warm. Administer two or

three drops of spirits of camphor in a teaspoonful of glycerine twice daily. Inhalations of steam from hot water containing a few drops of terebene, are useful. Feed on soft, warm food, such as oatmeal porridge or rice pudding slightly seasoned with ginger or cayenne.

Bumble-Foot.—A hard, corn-like growth upon the ball of the foot. CAUSES.—Confinement on hard ground. In heavy breeds, the flying down from perches that are too high. Predisposition. SYMPTOMS.—Lameness; swelling of the foot. TREATMENT.—If the corn is hard, pare it with a sharp knife and apply a little acetic acid to the centre daily. Bed the bird on soft, clean hay. If an abcess forms, the place should be lanced, the matter squeezed out, and the wound washed with warm water. After drying apply carbolic oil and bandage.

Cholera.—An epidemic diarrhœa. Highly contagious and apparently allied to the cholera morbus of human beings. CAUSES.—Defective hygiene, dampness, impure water or an intermittent water supply; decomposing matter, animal and vegetable, about the runs; contagion—the bacilli being conveyed into healthy birds by the latter picking up food or grass contaminated by the droppings of affected birds. SYMPTOMS.—Loose evacuations of a white or green colour; the bird is sleepy and depressed; plumage ruffled; the fluff about the tail wet and matted together; comb dark; there is great thirst throughout; the disease runs its course rapidly, death taking place (usually in stupor) in a few hours. A post-mortem examination discloses a highly inflamed condition of the intestines, mouth contains a sticky substance, throat is purple. Skin under the plumage very dark, and that upon the abdomen green.

TREATMENT.—None recommended. In the event of the disease being very prevalent, Pasteur's vaccine may be used. It is the only treatment that is of any practical use. The disease is so terribly rapid in its progress that the victims are usually too weak for any treatment by the time restora-

tives are applied. Further, it is so deadly and contagious that every affected bird, while it lives, is a refuge for untold numbers of bacilli which are liable to be transmitted to healthy stock, no matter how much care is exercised. Kill and burn every bird as soon as it shows the first symptom. Remove the non-affected ones to fresh and dry runs, thoroughly disinfecting the old ones. The droppings of diseased birds should be treated with a strong carbolic acid disinfectant. There is no more difficult disease to stamp out than this one, and unless the most exacting means and persistent effort are employed, it will keep on reappearing, perhaps for years afterwards.

Catarrh.—The common "cold in the head" to which we ourselves are subject. CAUSES.—Exposure, draughts, damp, sudden changes of temperature, contagion. SYMPTOMS.—Watery discharge from eyes and nostrils; swollen face; ruffled, lustreless plumage; sneezing.

TREATMENT.—Administer one-third of a teaspoonful of Epsom salts in warm water, and three hours afterwards give two or three drops of spirits of camphor in a meal pill. Continue to give the latter twice daily. Keep the eyes, nostrils, and mouth well sponged with a warm, weak solution of permanganate of potash and water, drying thoroughly after each operation. Keep the bird warm, and feed on soft, nourishing foods seasoned with cayenne. Although this disease is not a serious one it is, without doubt, contagious, and, if neglected, may lead to roup.

Crop-bound.—An abnormal accumulation of food of a fibrous, husky, or hard nature in the crop. CAUSES.—Careless, irregular feeding, the presence of long, wiry grass or hairs that bind the contents of the crop into a hard lump; irregular water supply. SYMPTOMS.—The bird is listless, and wanders about by itself. Crop very much distended and hard; the breath foul.

TREATMENT.—Dissolve half an ounce of Epsom salts in a pint of warm water, and give the bird one or two teaspoon-

fuls. Gently knead the crop so as to soften and loosen the contents. The process is a long and tedious one, but with patience the part will become soft. Then administer a little more of the salts (diluted with warm water), and place the bird in a pen. If after two hours the crop is still its original size, and, if anything, harder than it was, it is best to kill the bird. Supposing, however, that it is a valuable specimen, or one that it is particularly desired to save, an operation must be performed. An incision about one inch long is made at the upper part of the crop, and the contents removed with a small silver or bone spoon. When all is clear, wash the interior of the crop with warm water, containing a little permanganate of potash, and stitch together the aperture. Use a fine needle and silken thread. First get the inner skin secured with not less than three stitches, and then do the same with the outer one. Apply a little carbolic oil to the part, and the bird will soon be all right. For a few days feed on bread and milk (not too moist), and do not give any water for forty-eight hours.

Diarrhœa (See Cholera).—CAUSES.—Sudden changes in the temperature; injudicious feeding, dampness, sour food. SYMPTOMS.—Watery evacuations. General depression.

TREATMENT.—In mild cases put a little Epsom salts in the drinking water, and then feed on soft food, mixed crumbly with milk, and containing some boiled rice. If the ailment does not disappear with that, give a meal pill containing three drops of spirits of camphor every three hours, and a 1 grain opium pill every night. In the case of diarrhœa with young chickens, individual treatment is scarcely practicable. Put a lump of camphor in their drinking water, keep them scrupulously clean, feed largely on boiled rice (mixed dry with fine oatmeal), and remove the cause of the ailment, which may usually be found in overheating or injudicious feeding.

Diphtheria.—Often called "roup," "canker," or "ulceration." A highly contagious, dangerous disease. CAUSES.—A bacillus. Birds usually attacked are those that are or

have been suffering from roup. Damp, insanitary houses and runs. Uncleanliness and lack of fresh air and sunshine. It spreads rapidly by contagion. SYMPTOMS.—Catarrhal discharge, depression, specks of white, or large yellowish growths in the throat and mouth, or about the eyes. Offensive breath; the throat a bluish purple colour, emaciation; finally, the dipheritic membrane forms across the throat suffocating the bird.

TREATMENT.—In the case of ordinary stock it is wisest to kill off every diseased bird, burning the bodies. The malady, however, is amenable to treatment if taken in time, but the greatest care must be exercised in isolating the sick birds, and all utensils, etc., used by them. Further, it is as well to remember that it is by no means unlikely that this terrible disease cannot be transmitted from animals to man. To cure diseased birds put them in a warm room—one with a moist atmosphere preferably. Remove all growths that come away easily, burning them, and the remaining ones paint with the following lotion (prescribed by the late Mr. Lewis Wright), viz., carbolic acid, 1 dr.; sulphurous acid solution, 3 drs.; tincture perchloride of iron, 4 drs.; glycerine, 4 drs. Use a small paint brush, and apply a little to the specks twice or thrice daily. Wash the eyes and nostrils frequently with the solution of permanganate of potash, as advised in the case of "catarrh." Administer a chemist's "sore throat mixture" two or three times a day, allowing a medium-sized bird about one-third human adult dose. Feed on soft, nourishing foods, such as bread and milk, custards, or porridge, for the strength of the patient must be kept up at any cost. When the growths disappear, and the bird begins to look brighter, give an iron tonic and a little raw lean meat daily.

Dropsy.—Sometimes occurs both of the crop and the abdomen, but birds so affected are seldom worth curing. SYMPTOMS.—Accumulations of watery matter in the parts mentioned, causing them to "bag" or become pendulous.

TREATMENT.—Get a veterinary surgeon to tap the bird. Administer 4 grains of iodide of potassium daily. The crop may

be emptied by holding the bird by the legs and causing the liquid to be vomited, by a gentle downward pressure.

Egg-bound.—Inability to eject an egg, usually through the latter being unusually large. Hens that are too fat are frequently egg-bound. SYMPTOMS.—The bird visits the nest frequently, but without laying. The tail is carried low, sometimes touching the ground. The wings droop, and there is evident pain and distress.

TREATMENT.—Foment the vent by holdng it over the steam arising from a jug of boiling water for about ten minutes. Lubricate the part with the finger, or a feather, dipped in salad oil. Then place the hen in a basket lined with hay, and she will probably pass the egg in a short time. If not, the egg may be assisted towards the aperture by a gentle pressure from the outside, but the greatest care must be exercised to avoid a breakage. Give nearly half a teaspoonful of Epsom salts in a little warm water before commencing operations and again twelve hours afterwards.

Egg-eating.—Although scarcely a disease, this bad habit may be treated as one, for when an individual commences egg-eating the vice quickly spreads through the flock like a plague. CAUSES.—Lack of employment, want of shell-making material; empty drinking vessels, broken eggs; too close confinement.

TREATMENT.—Remove the causes and isolate the offenders, giving them a surfeit of egg-shells, bad eggs, or stale ones, morning, noon, and night until the appetite is sickened. If the vice is general, the whole flock may be so treated, using the while patent nests to ensure the safety of the eggs laid. When the vice is cured, give a little sulphur in the soft food every other day for a week.

Eggs, Blood Spots in.—Brought about by slight hæmorrhage in the ovary or oviduct. CAUSES.—Too much stimulating food, such as spices and meat.

TREATMENT.—Give occasional small doses of Epsom salts, and reduce the diet.

Enteritis.—Inflammation of the smaller intestines. An epidemic disease that probably causes the deaths of as many fowls and pheasants every year as do all the other diseases put together. Causes.—Ordinary cases of enteritis sometimes occur from fowls eating unslaked lime, poison, or some other irritant, but these are isolated instances compared to an outbreak of contagious enteritis, which is caused by a bacillus that exists in the blood and tissues of diseased fowls and in their evacuations. As in the case of cholera, q.v.—to which this disease has some resemblance—healthy birds picking up food or grass fouled by the excrement of affected birds contract the disease. Symptoms.—Rapid prostration; heavy breathing; ruffled plumage, diarrhœa, the excrement being yellow or mustard colour instead of green as in cholera. The droppings in extreme cases are tinged with blood. There is intense thirst; weakness of the legs and spasmodic shivering.

Treatment.—None recommended, but where great issues are at stake, Dr. Klein's vaccine may be resorted to, with the object of checking the progress of the disease. All birds, on showing the first symptoms, should be killed and burned. Remove the non-affected ones to fresh ground, provide ample, dry shelter, and see that the water supply is good and sufficient.

Favus.—A disease caused by a microscopic fungus of a vegetable nature. It first appears as white scabs on the comb or face, which multiply, grow together, and become yellower and thicker if not attended to. The skin of the neck and rump is sometimes invaded, the feathers falling off.

Treatment.—Wash the parts with vinegar or warm water and soft soap, then rub in an ointment made of red oxide of mercury one part, and lard six parts. Nitrate of silver may also be applied effectually. Give the bird nourishing food, plenty of green stuff, fresh air, and an iron tonic. In treating the patient it is as well to bear in mind that the spores of the fungus float away in the air like dust, and, settling upon any scratched or abraded skin, take root. Most domestic animals may become affected by the disease in that way, and

even man himself is not immune. Many people, therefore, would prefer to kill a diseased bird outright, rather than run the risks that accompany any treatment of this loathsome disease.

Feather-eating.—A vice common to fowls kept in close confinement. It is the result of bad management; over-stimulation; lack of exercise and diversion; want of green food; insect pests.

TREATMENT.—Remove the causes which brought it about. Isolate the offenders, and give flowers of sulphur in the soft food (a teaspoonful to every six hens) every other day for a week or more. It is not the slightest use applying any nauseous dressing to the plumage until the cause which developed the vice has been removed.

Gapes.—A disease mainly confined to young chickens, young pheasants, and various species of wild birds. It is caused by the presence of small blood-red worms in the wind-pipe, which set up irritation, or multiply to such an extent that the bird is suffocated. SYMPTOMS.—Gaping, sneezing, or coughing. Rapid emaciation. The wings droop, and the sufferer often falls backwards in its attempts to breathe.

TREATMENT.—The disease is a difficult one to cure on account of the fact that it attacks such young birds, and, usually, so many of them, for when it does break out, it is in the nature of an epidemic. Individuals may be treated in one of the following ways: (a) Strip a few feathers of its web excepting the tip. Dip it in eucalyptus oil, and pass it down the chicken's wind-pipe (the entrance to which will be seen at the top of the throat just behind the tongue). Twist it round and withdraw it, and some of the crimson worms, or particles of them, will be seen adhering. To extract all the parasites, the operation will have to be performed several times, exercising great care not to lacerate the wind-pipe. (b) Take a hot cinder from the fire and pour upon it some carbolic acid. Hold the chicken's head in the fumes that rise up until the bird shows signs of fainting, then immediately place it in the

open air to recover. Care must be taken not to overdo the operation by poisoning the patient. (c) When a large number of chickens are attacked they may be put in a fumigating box, and treated with the fumes of carbolic acid en masse. The box must have a perforated false bottom on which the birds must be placed. The carbolic acid must be burned underneath and the box made air-tight at the top. A large pane of glass should be fixed into the lid, so that the operator can observe the chickens within, and immediately expose them to fresh air when they show signs of drooping. The operation will, perhaps, have to be gone through every day for several days before all the birds are cured.

PREVENTION.—All diseases ought, of course, to be prevented as far as possible, but gapes particularly calls for attention in this respect. Always rear chickens on fresh ground if possible. Dampness and humidity are favourable to the ova of the gape worm, which exist in water and in moist earth, so that dry places should be chosen for the chickens. Clean drinking water is essential, and, if gapes is suspected, keep a lump of camphor in each drinking vessel. Give chopped onion or garlic with at least two of the feeds each day. Always burn birds that die of gapes. Keep the chickens robust and free of insect pests; particularly ticks.

Gout.—A swollen, heated condition of the feet and joints, usually attacking birds that are brought up in close confinement, and which are unsuitably fed.

TREATMENT.—Dissolve Epsom salts in the drinking water, give a plain diet, and plenty of green stuff. To relieve the affected parts immerse them in warm water, afterwards applying a liniment.

Leg-weakness.—Young, growing cockerels of the heavy breeds often lose the use of their legs at the age of five or six months, especially if they have been forced. It is best to kill such birds, as they will be of no use for breeding, unless required for show purposes.

TREATMENT.—Nutritious but non-fattening food. Adminis-

ter one-third adult human being doses of a salts of iron and phosphate of lime mixture. Rub the legs with an embrocation if cramp sets in. The use of dry bone meal from an early age will go far to prevent leg-weakness.

Liver Disease (Tuberculosis).—One of the commonest and most dreaded of all poultry disease. CAUSES.—A tuberculous bacillus, considered by many to be analogous to that which attacks mammalian animals. When the bacilli are found in the lungs the disease is known as "consumption." Highly contagious, and if the disease itself is not actually inherited, the tendency to it undoubtedly is. Poultry suffering from liver disease should not be bred from, they are unfit for food, and it would be very unwise to eat eggs laid by them. Birds that are over-fed and kept in ill-ventilated houses and dirty runs are most liable to attack. SYMPTOMS.—Emaciation ("going light"), particularly of the breast flesh, lameness, appetite variable, but often quite good; comb and wattles pale; a yellowish tint about the face; sunken, dull eyes. A post-mortem examination discloses cheesy growths upon the liver and often extending to the other organs.

TREATMENT.—None recommended. Kill and burn all diseased birds, and remove the others from the infected area; thoroughly cleansing and disinfecting the latter, and leaving it vacant for at least twelve months. Pay special attention to ventilation (oxygen being known to be the greatest enemy of the tuberculous bacillus), and to cleanliness; feed on a non-stimulating diet, giving plenty of fresh green stuff daily as well as grit and pure water.

Pneumonia.—Inflammation of the lungs. CAUSES.—Sudden changes of temperature, exposure, and, in young chickens (especially those reared in foster-mothers), over-crowding, and consequent over-heating, at night. Hereditary predisposition. SYMPTOMS.—Cough, gasping for breath; expectoration; ruffled plumage; a crackling sound can be heard if the ear is placed against the bird's back between the shoulders.

TREATMENT.—In the case of adults paint the skin on the back between the wings with iodine once daily. Give three drops of chlorodyne in a teaspoonful of linseed tea every four hours until improvement sets in, when it may be given less frequently. Keep the bird warm and feed on a soft, nutritious diet. Little can be done to relieve young chickens. Give more room and fresh air at night, and mix a few drops of chlorodyne and a teaspoonful of glycerine in each half-pint of drinking water.

Rheumatism.—Distinguished from gout by the absence of swelling and heat. CAUSES.—Dampness, cold; many birds are hereditarily predisposed to rheumatism.

TREATMENT.—Rub the parts with any good liniment—one of chloroform and belladonna being exceptionally serviceable. Keep the bird warm, and give a mild aperient, such as a small dose of Epsom salts once daily. Feed on an unstimulating diet, in which has been mixed a pinch each of bicarbonate of soda and chlorate of potash.

Roup.—A highly contagious form of catarrh, sometimes becoming malignant or diphtheritic (see Diphtheria). CAUSES.—Insanitation, draughts, over-crowding, dampness, cold, contagion. SYMPTOMS.—The disease usually commencing as a common cold (see "Catarrh") it must be treated as such, but when there is a thickening of the discharge from nostrils and eyes, and the breath becomes very foul, other measures should be resorted to. A bird affected by roup is feverish and depressed. The face swells so that the eyes are often entirely hidden and sealed up; breathing is laboured emaciation rapid.

TREATMENT.—Sponge the parts continually, as advised under "Catarrh." Give eight drops of sal volatile in a teaspoonful of warm water twice daily, and paint the swollen parts with iodine, taking care that the tincture does not get into the bird's eyes. As soon as improvement sets in give a mineral tonic in one-third human adult doses. Keep the bird warm, and feed on a nourishing diet, such as bread and milk, or poridge, seasoned with a little cayenne or ginger. Thoroughly

clean and disinfect the runs and houses that contained the diseased birds; find out the cause of the outbreak and remove it.

Scaly-leg.—See page 108.

Tuberculosis.—See "Liver Disease."

White Comb.—Birds that are kept in dark, damp, ill-ventilated runs, deprived of green food and sunlight, contract a mild disease of the comb, upon which appears a white scurf or powdering, which sometimes extends to the feathers of the neck and body.

TREATMENT.—Remove the causes of the disease, and mix a little sulphur in the soft food every alternate day for a week. Supply a plentiful allowance of green stuff, nourishing, non-heating food, and give (after discontinuing the sulphur) a mineral tonic. Carbolic oil may be applied to the affected parts.

Worms.—Birds suffering from parasitical worms in the intestines are listless, weak, and thin, although they may eat well—sometimes ravenously. These symptoms being, however, common to other diseases, the droppings underneath the perches should be examined for traces of worms. If the latter are the cause of the ailment, they will be discovered whole, or in pieces, in the evacuations.

TREATMENT.—Administer one grain of santonin and five grains of powdered areca nut in a tablespoonful of warm milk and water to each affected bird. Give the dose when the bird is fasting, and feed on warm, soft food for a day or two. Fowls that are kept in dirty runs and fed on impure food and unsound grain are most subject to worms.

VERMIN.

Lice.—If provided with a good dust bath, healthy fowls will usually rid themselves of these pests, but when only a few are kept it is desirable to dust them individually with pyrethrum powder. Old stock cocks and broody hens particularly require individual attention. To dust a fowl properly she should be held by the legs by an attendant and laid on a newspaper. The operator can then raise the feathers with one hand while he uses the dredger with the other. The powder must be got well under the feathers, and that which falls off, and which would otherwise be lost, may be gathered up off the paper. An oil made up of linseed oil eight parts, and paraffin two parts, may be used by applying it in small quantities on different parts of the body, more particularly at the root of the tail and under the wings. Where a number of fowls are kept I am in favour of submitting them to an annual dip, to take place in July or August. The dip may be prepared as follows: Dissolve, by boiling, one pound of any well-known disinfectant soap and one pound of yellow soap in three quarts of water. When boiling add a pint of paraffin (precaution being taken against fire) and a tablespoonful of carbolic acid; mix this thoroughly and dilute with sixteen quarts of water. Choose a warm day for the operation, and dip each fowl for about two minutes, working the water well into the feathers. Rinse in a tub of plain water, and, after squeezing as much water as possible out of the feathers, the fowl may be held by the legs to flap her wings, and then replaced in the run. The dip is used cold, and no injurious effects follow.

Fleas are often troublesome during the summer months, and infest the houses and nests more than they do the hens themselves. If not checked they increase with amazing rapidity, and I have seen them so numerous that the poultryman refused to enter the houses to collect the eggs! Frequent lime-washing is an effectual preventive of all insect

pests, but when once the vermin have taken possession of a house, more stringent measures will have to be employed. Pyrethrum may be used in the nests, but spraying with a very fine spray-pump, using the above dip diluted with only two quarts of water is far more deadly. This must be done at intervals during the summer, or whenever the insects show signs of their presence.

The Red Mite is a very minute creature, making its home in the cracks and crevices of perches and walls, and coming out at night to suck the fowls' blood. The ravages of these pests have often been the main cause of failures in poultry keeping; they increase rapidly, and literally swarm in thousands if not instantly prevented, and hens that are not only tormented but weakened by loss of blood can scarcely be expected to lay. The mites may be killed by the application of paraffin, or by spraying, as recommended above. Whatever method be employed, the perches particularly must be dressed with the liquid as well as the slots in which they rest. Attending to the perches in this way will also prevent the spread of the species of itch-mite which is the cause of the loathsome disease known as

Scaly Leg.—Those breeds of fowls that have feathered shanks are more liable to attack from this parasite. The legs and feet become scurfy, and a dirty white colour. An encrustation forms, the scales of the leg become detached and fall off, and the bird frequently loses the entire use of its limbs. Diseased fowls should have their legs and feet scrubbed with a nail-brush, and an emulsion of soft soap and warm water, afterwards being dressed with a solution of paraffin and lard, in equal parts, and thoroughly mixed when warm. The operation may have to be repeated several times, but the great thing is to check the disease before it has made much progress.

CHAPTER XII.

PRESERVING EGGS.

I AM not an advocate for preserving eggs for marketing purposes unless there are uncommon circumstances to justify one's doing it. Preserved eggs, however, come in very useful for the household during the winter months, and either one or other of the following methods of preserving may be employed. It is of the greatest importance that all eggs intended to be kept for any length of time be quite fresh when placed in the preservative.

Water-glass.—To one pound of water-glass, which almost any chemist will supply, add six quarts of hot water. Stir briskly and leave to cool, then pour the liquid into the vessel, which may be of almost any material, and place the latter in a cool place. The eggs may then be put in daily, as they are laid, until the vessel is nearly full, but at least an inch of liquid should remain above the eggs.

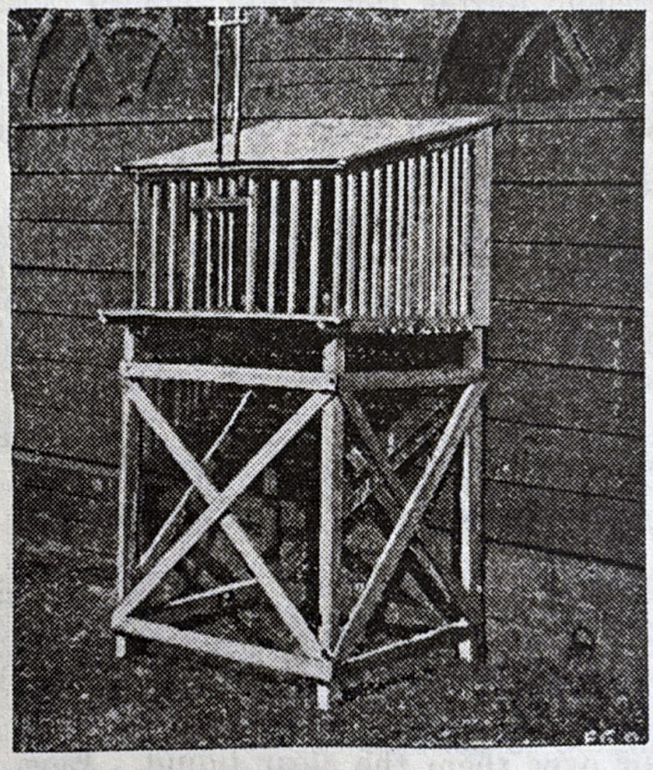
Lime—Pour 1 gallon of water on to 1 lb. of quicklime. The following day stir the mixture and add 6 ozs. of salt and 1 oz. of cream of tartar, mixing the whole well together. When all the sediment has settled, place the eggs in an earthenware jar and pour over them the clear liquid. Eggs may be put in from day to day, but they must always be well covered.

Before boiling preserved eggs the larger end should be pierced with a pin.

CHAPTER XIII.

HOW TO TREAT BROODY HENS.

The old-fashioned methods of "curing" a hen of her broodiness, either by ducking her in a pond or putting her in a dark place to starve for three or four days, have been superseded



Coop for Broody Hens.

by the more humane and more effective broody coop. A box, three feet six inches long, and three feet wide may easily be made into a broody coop for six hens, as follows: Waterproof the top, and nail round bars two inches apart at the

bottom, running lengthwise. Construct the front as in the illustration, and place a trough for food and a pan for water within reach of the prisoners. The hens only being able to perch on the bars, there is a continual passage of cool air underneath them, when the coop is placed on legs, which soon cures them of the broody instinct. During the process, which usually lasts about three days, they must be regularly fed and watered, so that they will soon be able to commence laying again, and if the coop is placed in sight of the other fowls, so much the better.

CHAPTER XIV.

TABLES FOR POULTRY KEEPERS.

DRY OR CORN MEASURE.

2 pints	=	1 quart.	2 bushels	=	1 strike.
4 quarts	=	1 gallon.	4 bushels	=	1 coomb.
2 gallons	=	1 peck.	8 bushels	=	1 quarter.
4 pecks	=	1 bushel.	10 quarters	=	1 last.

Boll of meal = 140 lbs.; 2 Bolls = 1 sack.

There are various other measures in use in different parts of the country which are strictly local in their application. When poultry food is sold by measure, the weight of the latter should always be ascertained by the buyer. The weight of an Imperial bushel of the various foods should be as follows:—

Wheat (English)	63 lbs.	Barley Meal	42 lbs.
Dari	60 ,,	Maize Meal	47 ,,
Barley (English)	56 ,,	Middlings	32 ,,
Potatoes	56 ,,	Ground Oats	30 ,,
Maize and Rye	60 ,,	Malt Culms	14 ,,
Oats (English)	42 ,,	Bran	17 ,,
Buckwheat	52 ,,		

Periods of Incubation.

Hen	20 to 22 days.	Turkey	28 to 30 days.
Duck	28 to 30 ,,	Guinea Fowl ...	26 to 28 ,,
Goose	28 to 31 ,,	Pea Fowl ...	28 to 30 ,,

Mating Poultry.

Ducks, Heavy Breeds ...	2 or 3 to 1 drake.
,, Light ,, ...	3 or 4 to 1 ,,
Hens, Heavy ,, ...	5 to 7 to 1 cock.
,, Light ,, ...	6 to 8 to 1 ,,
Geese	2 or 3 to 1 gander.
Turkeys	5 to 8 to 1 cock.

In mating, it must always be borne in mind that the males differ considerably in constitutional vigour, and some may be more heavily mated than others. Male birds on unlimited runs may be given nearly twice as many hens as would suffice in confinement.

Table of Foods.*

There is in every 100 parts by weight of—	Flesh-forming Material viz., Gluten &c.	Warmth-giving and Fattening Material.		Bone Making-Material or Mineral Sub-stances.	Husk or Fibre.	Water.
		Fat or Oil.	Starch.			
Beans and Peas ...	25	2	48	2	8	15
Oatmeal	18	6	63	2	2	9
Middlings, Thirds, or Fine Sharps	18	6	53	5	4	14
Oats	15	6	47	2	20	10
Wheat ...	12	3	70	2	1	12
Buckwheat ...	12	6	58	1½	11	11½
Barley	11	2	60	2	14	11
Indian Corn ...	11	8	65	1	5	10
Hempseed	10	21	45	2	14	8
Rice	7	a trace	80	a trace	—	13
Potatoes	6½	—	41	2	—	50½
Milk	4½	3	5	¾	—	86¾

*From the "Illustrated Book of Poultry" (Lewis Wright), by permission of Messrs. Cassell & Co., Limited.

CHAPTER XV.

THE POULTRY KEEPER'S CALENDAR.

January.—The first month of the year is a most important one for the poultry keeper. The main business is the mating of the breeding-pens, upon which so much depends. Go carefully over each bird, rejecting all those that are undersized, diseased, malformed, or which do not promise to fulfil the object in view. See that the cock or cockerel has been well-fed and is in prime condition. If he does not mate readily, but bullies the hens, replace him by another. Do not overstock the pens, but endeavour to allow as much liberty as possible. Provide plenty of litter in the houses and sheds, and keep the birds busy scratching for some hidden corn when the weather is too bad for them to get outside. Give the breeders a good proportion of nitrogenous food such as cut-bone, meat or pea meal, and, if the weather is severe, allow some maize occasionally. Hatch as many chicks for the table-fowl trade as possible. They will fetch top prices at Easter, and later, and will well repay the owner for the extra attention required. Provide plenty of shelter for both young and old, and keep all as dry as possible. See that the breeding stock are not too young. A cockerel mated to two-year-old hens, or an old, but vigorous, "rooster" mated with pullets, will produce the strongest chickens.

February.—Hatching chickens for table must still be continued vigorously. The demand for eggs for incubation will increase this month, and to satisfy your customers as well as yourself, the germs must be kept strong. The stock birds must not be neglected for the sake of the youngsters. Maintain the former in a good, vigorous condition, without over-stimulating the egg-organs nor over-feeding. Grit and shell, or old mortar rubbish, are absolutely essential materials for the maintenance of robust health. Do not over-do the

moisture in the incubators, and the nest of the sitting hen will require none at all. This is proverbially a month of rain, and few things are more productive of disease than sloppy ground, and wet, foul sleeping places. Collect eggs frequently, and store until required, in a cool, dry place. If placed large end downwards, in boxes and covered with bran, so much the better. Be careful that the older chickens are not overcrowded at night, and go round the foster-mothers after dark to see that all is well. Remember that the sun rises earlier every day, and the stock must not be kept waiting for breakfast. Feed the youngest first.

March.—If the breeds kept are of the heavier kinds—Orpingtons, Wyandottes, or Asiatic cross-breds—the main supply of pullets for the following winter's laying must now be hatched. Set every available egg throughout this month, for "there's no chicken like a March chicken." Do not confine the menu to any particular method of feeding. Ring the changes between the various meals, and use soft mixtures and "dry feed" alternately. Watch the chickens' appetites, and feed accordingly; the oftener the better so long as they are always keen and eat hungrily. Animal food as well as fresh vegetable is necessary, and full advantage must be taken of every gleam of sunshine. The older chickens will benefit by having at least one feed a day of boiled barley. Let them have as much liberty as possible. Some linseed meal added to the staple mixture of ground oats and middlings will assist feathering, and green cut-bone will give them stamina, and increase the rapidity of growth. Keep an eye on the breeding pens and, if one or more of the stock cocks appears to be going off in condition, immediately put him by himself and feed him up. If there is one held in reserve in case of such an emergency so much the better. Cod-liver oil and quinine capsules are useful in such cases.

April.—Hatching the heavier breeds may still be continued if the last month's output proved inadequate. The non-sitting varieties—Anconas, Leghorns, and Minorcas—must

be produced this month, so that they will begin to lay before winter sets in. They mature faster than the Asiatics and are, on the whole, more profitable as egg producers. There are probably more chickens hatched in April than in any other month, and overcrowding must be avoided at all cost. As the foster-mothers become vacated by the older lots, wash them out with quicklime containing a little paraffin oil, and leave them open to the sun and air. Keep old and young separate, and put the cockerels and pullets of the earlier hatches apart as soon as they can be distinguished. Put the "best" on the market at the first opportunity, but beware of sending out under-sized, badly fattened specimens. Aim at the "best," and grade the consignments according to size and quality. If there are any surplus eggs, incubate them, and sell the chicks as "day-olds," or place the former in a preservative. They must, however, be fresh when put in the latter, no matter what it may be composed of.

May.—Sittings of eggs from the lighter breds may still be advertised, and the last batches of chickens from such must be brought off before the end of the month. Those provincial poultry keepers who cater for a seaside trade must commence hatching eggs for table fowl and ducklings. There will be a brisk demand for the latter in most places during the "season." Add some dry bone-meal to the food prepared for pullets and cockerels which are to be kept for stock. Now that the sun is gaining power less artificial heat will be required during the daytime in the brooders. Give the eggs in the incubators rather more airing and allow the broody hens fifteen to twenty minutes daily. Do not forget to use insect powder freely in the nests and see that the dust baths are dry. A sprinkling of powdered sulphur over the latter will be beneficial.

June.—Long days and short nights, much work and little rest, are the lot of the poultry keeper this month. Expenses are also high on account of the number of young stock on hand. Late broods of chickens or lots from the incubator

that are not required, should be disposed of. The insect fiend must be vigorously attacked this month. Examine the youngest chickens for ticks, and the older ones for lice, every few days. Ticks will be found adhering to the skull and neck, and must be killed by the application of a drop or two of carbolised oil (1 in 20). Insect powder will destroy the lice; and the litter in the coops and foster-mothers must be frequently renewed. Keep a sharp look out for the "red mite" (see Chapter XI.), and exterminate it before it becomes established, or there will be untold trouble. Now that vegetable food is becoming plentiful, it will simplify the work to use "dry feed" very largely. Provide plenty of fresh water daily. Break up the breeding pens and dispose of all old hens or any pullets which will be no longer required. The stock cocks which are to be kept on, may be put into the cockerel pens. Give the growing pullets as much liberty as possible, and run them in movable houses in the open fields if possible.

July.—The work for this month will be, for the most part, a repetition of that of June. It is still needful to maintain a sharp look out for vermin, and to avoid overcrowding, both by day and night. Provide ample shade from the hot sun, and keep the drinking water cool.

August.—The trade at the seaside or other holiday resorts will now be at its height. It will not last many weeks so that the poultry keeper who is prepared for it will come off best. Some of the earlier pullets will be commencing to lay. Do not force them nor spoil your market by putting their immature eggs in with the larger ones. Do not allow pullets and old hens to run together.

September.—The process of weeding out the stock may now be commenced, and it will be necessary, on account of the differences in size, to continue it for some months. Cockerels and pullets must not only be kept apart,

but those intended for stock and those destined for table must be separated. Give the moulting birds a little powdered sulphur in the soft food: it will assist feather growth. Set eggs of good quality table fowls, and large ducks, to produce youngsters to be ready for the Christmas market. Lay in a good stock of peat moss or collect the autumn leaves, storing in a dry place for winter littering. If the demand for goslings is good, dispose of as many as possible this month and next.

October.—Commence feeding the pullets more generously, giving animal food (cut green-bone, if possible) daily. If there is any stubble let them have full advantage of it. Keep the birds in small flocks—15 to 20. Look out for leg-weakness among the cockerels of the heavier breeds. Dry bone-meal may still be used, and a piece of sulphate of iron, the size of a filbert, placed in each quart of water. Give all coops and foster-mothers a thorough cleaning before putting them away.

November.—The pullets will require special attention this month as regards feeding. Continue the meat or green-bone and allow some maize occasionally in the afternoons. Keep the houses dry and well littered, and encourage scratching exercise under cover in bad weather. Remember that dampness retards egg-production, and the layers must be kept comfortable without being coddled. Some pea or bean meal will be a useful addition to the staple diet, and linseed meal is also highly beneficial in cold, damp weather. The autumn chickens and ducklings must be given ample vegetable and animal food, and a dry, well-littered shelter is no less important for them than it is in the case of the layers. Feed well on a somewhat fattening diet, house well, and limit the range, so that the birds will not be so much affected by the closer confinement necessary during the last stages of fattening. Get your Christmas orders in good time.

December.—Feed well the Christmas ducks, turkeys, and

geese, and increase the "fatty" constituents of the daily fare. Cage-fed fowls may now be crammed for those markets which appreciate and pay for the extra weight and quality. Use skim milk (or buttermilk) and ground oats largely for fattening all classes of poultry. Aim at producing the very best. Put the stock on the market properly packed, clean, and graded.

Balance the account of receipts and expenditure at the end of every month, and again every six months, i.e., in June and December. Keep a careful record of the stock, both "live" and "dead," and bear in mind that success cannot be attained without accurate book-keeping.

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